

## INTRODUCTION

The Ouray National Wildlife Refuge was established on 25 May, 1960 by the authority of the Migratory Bird Conservation Act of 1929. Land acquisition was initiated in November 1960 through the use of Duck Stamp funds. The Refuge became operational in late 1961 for **“use as an inviolate sanctuary, or for any other management purpose, for migratory birds.”**

The Refuge lies in the Uintah Basin located in northeastern Utah in Uintah County. The Refuge can be accessed by driving U.S. Highway 40 west 14 miles from the town of Vernal, then turning South on State Highway 88 and traveling 14 miles to the Refuge entrance.

The administrative boundary of the Refuge consists of 12,142 acres. This acreage includes 2,692 acres of leased Tribal lands, 1,153 acres of leased State lands, 3,110 acres removed from public domain, 5,032 acres of fee purchased lands and 155 acres of FmHA easement (Stan Wheeler easement).

The climate for the area is that of a cold desert biome with low precipitation and extremes in temperatures. Annual average precipitation is approximately 7 inches with the majority falling in the spring and fall. Temperature range is from - 43°F to +110°F with an average of 113 frost-free days.

Soils in the upland benches are fine sand or fine sandy loam intermixed with rough, stony broken ground. Bottomland soils are fine sand, sandy loam, clay loam or silty clay. The uplands are separated from the bottom lands by broken and stony bluffs of sandstone and shale. Some of the soils exhibit a fairly high degree of alkalinity, including both calcium and sodium salts.

The Uintah Basin is a subdivision of the Colorado Plateau physiographic province. Refuge habitats include approximately 19 square miles of bottom lands and river surface that occur in six naturally occurring bottoms along the shallowly entrenched Green River. Benchlands are held up by upper strata of the Uinta Formation which formed rounded and sculptured bluffs bordering the river valley. Pleistocene and earlier terrace gravel cover the benchlands. Bottoms and alluvial fans derived from the benches cover the margins of river terraces in the valley bottoms. Elevation ranges from 5,072 feet above sea level atop Leota Bluff to 4,650 feet along the Green River at the South end of Sheppard Bottom.

Refuge habitats are classified into eight different types: riverine, riparian woodlands, wetlands/bottom lands, moist-soil units, croplands and semidesert shrubland. Riverine habitat consists of approximately of 1,180 acres with minimal aquatic vegetation. Riparian woodlands occur along and adjacent to the 16 miles of the Green River that flow through the Refuge. This habitat totals approximately 1,282 acres and consists primarily of Fremont's cottonwood with an under story of peach-leaf willow, narrow-leaf willow, whiplash willow, skunkbush sumac, silver buffaloberry and some western wheatgrass. Wetlands/bottom lands habitat is comprised of six flooded bottoms totaling 3,110 acres (not including flooded riparian areas). In down stream order they are, Johnson Bottom, Leota, Wyasket Pond, Wyasket Lake, Sheppard and Woods. Moist soil units consist of five independently controlled impoundments which total 50 acres. Croplands comprise 150 acres and are farmed by a cooperative farmer on a rotational basis with alfalfa, barley and grain sorghum. Semidesert shrubland is 2,731 acres and consists of plants species such as greasewood, big sagebrush, black sagebrush, rubber and low rabbitbrush. Grasslands make-up 1,520 acres and consists of alkali sacaton, inland saltgrass, western wheat grass and Great Basin wildrye. Clay Bluffs total 1,935 acres on the Refuge but little is known on the role they play as habitat for wildlife.

As of 1998, the Refuge has taken a new and innovative look at the role of the Refuge in the Upper Colorado ecosystem. Recently adopted management strategies take into account new biological information and insight into the importance of western riparian and floodplain systems. We have come to the realization that Refuge flood plains can not easily be transformed into "Prairie Pot Hole" type waterfowl production areas. Instead, emphasis is given to the riparian and wetland habitats and their function as a migrational stop-over for all migratory birds.

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## K. FEEDBACK

NTR



Desert flowers in bloom. *Calochortus nuttallii*, sego lily. Picture by Shauna Melius

## A. HIGHLIGHTS

- \* Second Tamarisk Beetle Release - see Section F.10.
- \* Refuge wide weed inventory completed - see Section F.10.
- \* Mountain lion tracks found on Refuge - see Section G.7.
- \* New trail and handicap accessible hunting blind construction begins - see Section I.1.



## B. CLIMATIC

The climate of Ouray National Wildlife Refuge is descri

bed as a high desert region.

The Green River. An oasis in the desert. (DP)

This is

characterized by

our high elevation and low levels of precipitation. On average Ouray receives 7-8 inches of precipitation annually. In 2007 the refuge only received 5.14 inches. In the month of November there was no precipitation observed and in June only a trace (less than 0.01 inches) had fallen. The

year started with very low temperatures and ended in December with the same. Summer, spring, and fall temperatures remained comparable to years passed.

The 2007 maximum temperature was 103 degrees Fahrenheit on July 3 and the minimum temperature was -36 degrees Fahrenheit on January 15.

MONTH	Max Temp	Min Temp	Avg Max	Avg Min Temp	Precip (inches)	Snow (inches)
January	36	-36	14.9	-12	.02	10.6
February	58	-20	39.4	14	.04	T
March	74	12	60.1	28.9	.07	0
April	87	24	68.5	37.7	.11	0
May	91	33	79.4	44.1	.87	0
June	101	36	91.3	53.2	T	0
July	103	51	98	60	.25	0
August	100	45	94.2	56.4	.46	0
September	94	31	80.7	45.1	1.08	0
October	81	18	66.8	31.9	.37	0
November	66	3	53.7	18.7	0	0
December	37	-22	18	0	1.87	20
TOTALS					5.14	30.6

## C. LAND ACQUISITION

### 2. Easements

The Colorado River Wildlife Management Area consists primarily of conservation easements on the Green, Gunnison, and Colorado Rivers in both Utah and Colorado. No additional easement were acquired in 2007. The total number of CRWMA easements is 16 plus one fee title parcel totaling 1,347.12 acres. This total remains grossly short of the original objective of 50 easements and 10,000 acres which was identified as needed to recover the endangered fish by the Colorado River Recovery Program.

Current Colorado River Wildlife Management Area Easement properties.

Acres

Green River

Thunder Ranch	455.10
IMC	12.00
Richens/Slaugh/Slaugh	78.00
<u>Lamb</u>	<u>463.00</u>
6	1,008.10

Colorado River

Hoaglund	90.00	
Bounds	25.45	
McGuire	3.40	Easement for access only.
Tipping	23.40	
GJ Pipe	17.64	Acquired in fee.
Pennington/Bird/Brenner	21.00	
Audubon	25.67	
Mesa County	20.06	
<u>Mesa County</u>	<u>12.90</u>	
9	239.52	

Gunnison River

Fedler	54.50
<u>Morgan</u>	<u>45.00</u>
2	99.50

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17 properties	1,347.12 acres
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**D. PLANNING**

1. Comprehensive Conservation Plan

The Ouray Comprehensive Conservation Plan (CCP) was completed and signed in July of 2000. This document is now used and referred to with some regularity by Ouray Refuge staff. The challenge in implementing the CCP lies in acquiring the funds needed to accomplish the identified goals.

Since the completion of the CCP, the Refuge has accomplished numerous objectives identified in the CCP. The most notable are:



comprehensive vegetation mapping, biological inventories of small mammals, reptiles and amphibians, selenium management through levee removal, rehabilitation of water control structures within Sheppard and Leota Bottoms, and improved invasive weed control.

## 5. Research and Investigations

### **Chemical Control Trial of Perennial Pepperweed**

Dr. Corey Ransom from Utah State University (USU), Department of Plants, Soils, and Biometeorology, established a test area in 2006 in L-7 to conduct a chemical trial on perennial pepperweed. Twelve chemical tests were conducted at two different times of year. The chemical tests were Habitat at 4, 6, 8, 12, 16, 24, and 32 oz/ac, Plateau at 8 and 12 oz/ac, Escort at 1 oz/ac, Telar at 1 oz/ac, and a control. Each chemical test was replicated in 4 plots. Each plot was 10' x 30'. Plots were hand sprayed. The first trial was conducted mid-June during flowering and the second trial was conducted after frost the first week of November. All spraying was completed in 2006. Only monitoring of the effects of the spray occurred in 2007 and will continue into 2008.

## **E. ADMINISTRATION**

### **1. Personnel**

3/98 Dan Alonso, GS-13, PFT.....Project Leader, EOD

10/92 Dan Schaad, GS-12, PFT.....Deputy Refuge Manager, EOD

Diane Penttila, GS-11, PFT.....Wildlife Biologist, EOD  
11/02

Collette Johnson, GS-4, TFT.....Office Automation Clerk, EOD  
3/07

8/97 Steve Breakfield, WG-10, PFT.....Maintenance Mechanic, EOD

5/05 Tim Driscoll, WG-7, PFT.....Maintenance Worker, EOD

Shauna Waughtel, GS-5, TFT.....Biological Science Technician, EOD  
5/06 - 11/07

Rebecca Chester, GS-5, TFT.....Biological Science Technician, EOD  
5/07 - 11/07

### **2. Youth Programs**

Youth Conservation Corp (YCC) consisted of two enrollees in 2007. Brian Miller and Josh Burr, both from Vernal, Utah worked primarily on various maintenance projects, but most efforts centered on assisting permanent WG staff constructing the accessible nature trail in Sheppard Bottom. Due primarily to conflicts with other jobs opportunities closer to home, both enrollees did not complete their appointments.

3. Other Manpower Programs

For the third year in a row the Refuge has hired a volunteer intern through the Student Conservation Association (SCA). Molly Staats from San Diego, CA worked as a SCA volunteer from June 19 through August 31. Most of her duties were associated with the weed

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2007 weed crew. L to R: Myah Nelson, Shauna Melius, Beth Chester, Molly Staats. (DP)

#### 4. Volunteer Program

The Refuge volunteer program in 2007 consisted of volunteers from numerous organization and individuals. Some of these were Ducks

Unlimited, Utah Dedicated Hunters, St. James Catholic Church Youth Group, Boy Scouts of America, The Audubon Society, and numerous individuals assisting with the Refuge annual open house and Christmas Bird Count.

Myah Nelson volunteered with the weed crew earning a small weekly stipend. In 2007 she worked 1,176.5 hours.

Her efforts were very appreciated.

## 5. Funding

<b>Project</b>	<b>FY03</b>	<b>FY04</b>	<b>FY05</b>	<b>FY06</b>	<b>FY07</b>
1261 (Operations)	\$461	\$441	\$436	\$258	\$247
1262 (Main)				159.4	161
1262 (Annual Maint.)	96.6	72.6	71.4	72.6	72
1262 (Heavy Equip)	31	15	0	75	78
1262 (Equip Rental)			12	0	17
1262 (Defer. Maint.)	0	257	126	114	1.5
1262 (Small Equip)			31	18	49
1263 (EVS)				84.9	68
1264 (LE)				.7	.7
2821 (VFE)				152	0
RONs	0	0	0	0	0
8610 (Qtrs)	17.1	3.1	4.5	3.2	6.5
YCC	5.3	4.2	3.9	5.5	5.6
Volunteers	.5	.5	.5	.6	.6
Volunteer Weeds			7.5	6	6
CWD(1261-CWDM)			9	8	9
1231 (Mig. Bird)	0	0	0	0	0

1946-0038 (CRRP)	50	50	50	50	50
9131/9263 Fire	6.8	9.4	2.1	2.1	2.4
9263 (PROJ/H570)			2.8	2.9	0
9141 (Wildfire)	0	13.6	0	0	0

## 6. Safety

Safety meetings, tail-gate sessions and related refreshers/certifications conducted in 2007 included fire refresher training/fire shelter deployment exercises, physical fitness tests, ATV, heavy equipment and fire engine operations, purchase and proper use of PPE and precautions taken against West Nile Virus, other wildlife diseases, heat stress, etc. DRM Schaad served as the station's collateral-duty safety officer.

A Report of Survey and Motor Vehicle Accident Report was completed in July for damage to the 2004 Ford F-350 pick up truck (see Major Maintenance Section). Damages to said property were due to operator error (seasonal staff backing and jack-knifing a utility trailer). The accident was reported in SMIS and reviewed/discussed in a safety meeting to prevent future occurrences. No one was injured in this accident.

MM Breakfield pinched a nerve in his back on April 9 while pouring concrete behind the office building. He received physical therapy but reported back to work after a couple days.

MW Driscoll lacerated his right ring finger on April 26 while attempting to raise a spring-loaded support jack on a utility trailer. He required some stitches but there was no lost time from work. A follow up tail-gate safety meeting was held to inform all staff about potential hazards with that jack.

Vernal Fire and Safety inspected/service all fire extinguishers in August (\$915).

## F. **HABITAT MANAGEMENT**

### 1. **General**

Refuge habitats consist of the following (this does not include area within administrative boundary not managed by Refuge):

#### **Refuge habitats and acreage.**

<b><u>Vegetation/Land Use Type</u></b>	<b><u>Acres</u></b>
Riverine	1,180
Riparian (Classified Wetlands)	4,392
Uplands	
Semidesert Shrubland	2,731
Grassland	1,520
Clay Bluffs	1,935
Agriculture/Farm Fields	150
Ouray National Fish Hatchery	24 <sup>1</sup>
Moist-soil Units	50
Headquarters, Shop, and Residences	5
Total	11,987

### 2. **Wetlands**

Refuge wetlands are located within five naturally occurring bottom lands adjacent to the Green River. In accordance with the station CCP we are exploring and experimenting with restoring the hydrologic connection between the river and floodplain. Water control structures are in the process of being replaced or constructed to facilitate a

wet/dry rotational scheme and enhance wetland habitat and mimic natural processes. Several interior dikes and portions of protective levees along the river have been removed in an effort to accomplish these objectives.

At the beginning of 2007, water was present in all Leota impoundments, all Sheppard impoundments, Parker P-1, 2, 3, and Johnson Bottom (old J-2 and J-3). The remaining impoundments were dry. All impoundments were 100% ice-free by March 16, 2007.

Pelican Lake water was used in Sheppard Bottom (S-1, S-3) and for cropland irrigation. Green River water availability was limited in 2007 due to below average snow pack associated with the Yampa River drainage. This greatly reduced the length of time water could be diverted through gravity flow inlet structures. **The Green River peak flow for 2007 occurred on May 17 at 12,000 cfs, recorded at the Jensen gauging station.** This low peak flow did not provide any overbank flooding through levee removal sites, reducing the amount of wetland habitat available for the fall migration.

Johnson Bottom: There was no Green River water diverted to Johnson Bottom in 2007 as it was scheduled for draw down. Green River water from 2006 carried over through the spring migration period but then evaporated by early July.

Leota Bottom: There was no Pelican Lake water diverted to Leota Bottom as the lower half of this wetland complex was scheduled for draw down. Green River water was diverted through the inlet structure to the upper impoundments (L1-6) May 13 through May 28. This narrow window of inflow limited fall habitat within Leota and the only water present at years end was in L-3, 4, 5, and 6.

Parker Moist Soil Units: The Parker MSUs were scheduled for draw down and did not receive Pelican Lake water in 2007. Units P-1, 2, 5 contained small quantities of water left over from 2006 but were dry by March.

Sheppard Bottom: Sheppard S-4 and S-3 received Pelican Lake water intermittently April 4 through April 20 (119 acre-feet) and September



6 through September 17 (126 acre-feet). There was no Green River water actively diverted to Sheppard Bottom through the inlet structure to accomplish prescribed burning and trail construction in S-1. However Green River was received in S5 (and to some extent S3 and S4) through the drain canal. As a result, the only water present in Sheppard Bottom at years end was in S-4.

Woods Bottom: Green River water was diverted into Woods Main through the outlet structure May 2 through May 21. Woods Backside received sub-irrigation water from the main pool. It was not feasible to fill Woods Main to capacity during this brief time period and as a result, it was completely dry by early August.

Wyasket Bottom: Green River water was diverted to Wyasket Pond May 15 through May 28, primarily to enhance riparian habitat in this bottomland. This impoundment was dry by early July.

All wetlands were 100% ice-covered by December 5, 2007. For more detailed information on impoundment water levels and use, refer to the 2007 Ouray Water Use Report.

### 3. Forests

Cottonwood stands adjacent to the river are considered the only forested areas occurring on the Refuge. The understory is composed of woody vegetation such as willows and skunkbush sumac with some interspersions of Russian-olive and tamarisk. Herbaceous cover includes wheatgrass, wild rye, and other grasses and forbs but suffers from infestations of perennial pepperweed and Russian knapweed. Spring runoff and regulated flows from Flaming Gorge Dam, which are highly variable, determine the amount of disturbance in this habitat.

In 2006, some riparian enhancement was conducted along the west side of Wyasket Pond. Some of the original topography remains in this area of ridges and swales resulting from overbank flooding. Discing was conducted along the sides of the ridges and in the swales and shallow flooding allowed.

Some germination of cottonwood did occur.

#### 4. Croplands

Ouray's cooperative cropland management program utilizes approximately 150 acres and involves one cooperator. The cooperator handles all farming operations including planting, cultivating, harvesting crops and operating/maintaining irrigation equipment. Refuge expenses include the cost of Pelican Lake water, parts for Refuge irrigation equipment and staff time to administer the program. Pelican Lake water was used to irrigate cropland areas intermittently from April through August 2007 (685 acre-feet).

Generally, the cooperator's share consists of two or three cuttings of alfalfa/grass used for hay while the Refuge's share is a small grain such as barley. In 2007, the cooperator's share consisted of 106 acres of alfalfa/grass (70%). The Refuge share was 26 acres of barley (Field B) plus an additional 19 acres of alfalfa/grass in Field D (30%). Whenever possible, a third cutting of alfalfa/grass is allowed on at least half the cooperator's share since migratory bird use appears to be higher in fields having lower regrowth.

The Refuge's share of barley was left standing and continues to receive use by Canada geese, sandhill cranes and mallards. Mule deer, elk and ring-necked pheasants make use of these fields as well. The proximity of croplands to the auto-tour route and concentration of wildlife also provides Refuge visitors excellent wildlife viewing opportunities.

We are continuing to monitor the efficiency of the farming program by requiring the cooperator to provide the station with an annual report summarizing economic costs and benefits associated with each year of production.

#### 5. Grasslands

Grasslands are located on the benchland areas west of the river and are highly dependent on annual precipitation. According to the vegetation mapping effort, galleta grass is the most widespread grassland type on the Refuge. Other associated grass and dwarf shrub

species include needle-and-thread, Indian ricegrass, purple threeawn, Russian thistle, broom snakeweed, prickly pear, cottonthorn horsebrush and shadscale. The largest threat to the Refuge grasslands is cheatgrass. Unfortunately, cheatgrass is very difficult to control.

## 6. Other Habitats

Restoration of the old fish hatchery site continued in 2007. Four small plots were hand seeded with rabbitbrush on March 12 and watered weekly. Irrigation of the native grass seeding started on April 12 until June 1. It was ended earlier in 2007 in hopes that the kochia would not grow so robust as it did in 2006. Irrigation consisted of 12 K-line pods for the lower half of the field and 15 sprinklers connected to fire hose for the upper half of the field. Sprinklers were moved daily by hand during the work week. Monitoring of the four transects was conducted on Sept. 10 for transect 1 & 2 (which is a non-irrigated seeding) and Sept. 24 for transect 3 & 4 (which is an irrigated seeding).

The native grass seeding took place in March, 2006. In the fall of 2006 some seedlings could be seen in the area that was irrigated though they could not be identified and only one occurred in a transect. No grass germination could be found in the area not irrigated. During the early summer of 2007, some grass seedlings could be seen in the irrigated area, especially on the upper half. But they all appeared to have gone dormant by late summer. A few dormant seedling did show up in the two transects that were irrigated and we were pretty sure it was western wheatgrass. Overall, the grass seeding has had fair to poor results. Very few seedlings can be seen on the lower half of the field, while the upper half has some. The advice from a local NRCS agent was to irrigate at one time for a much longer period, instead of moving the sprinklers every three hours or so to see if that would help get the grass seeding established.

The rabbitbrush seeding did not germinate at all, which makes us concerned about the viability of the two year old seed. However, along some of the edges of the field, some rabbitbrush is coming back where it had been previously disturbed when the field was being prepared for seeding. A greasewood in the lower part of the field has

grown quite large and several small greasewood bushes have now become established nearby the larger bush. A few cottonwood saplings are present in the center of the field near the K-line irrigation line. The saltgrass that was present on the field prior to seeding are in scattered patches and can be quite thick in some of the patches. Those areas are doing well. Since the area was not mowed at all in 2007, the alkali sacaton that was also present before reseeding is now much more prevalent than originally thought.

Weeds are still a big concern on the site. Perennial pepperweed was spot treated the middle of June. Progress is being made with this weed. Even with expanding beyond the restoration area quite a ways, only 2.12 acres were treated in 2007 compared to about 3 acres in 2006 and 3.5 in 2005. Russian knapweed, on the other hand, seems to be currently winning the battle no matter what we try and 2007 was a very frustrating year on that front. After hearing of others having success using a fairly new chemical - Milestone on Russian knapweed as it begins to flower, we tried it at the old hatchery site. On June 8 - 11 the large patches just within the main restoration site were sprayed which totaled about 2.6 acres. It became apparent that this treatment did not work in the slightest. Since we had used Milestone once, it could not be used in the fall for re-treatment when the Refuge has seen some success with it. So the site was treated September 21 - 27 postfrost with Plateau which had very poor success in 2006. A total of 9 acres was treated.

## 9. Fire Management

Prescribed fire is a tool used to reduce hazardous fuels and improve habitat conditions primarily within Refuge impoundments. Our goal is to burn wetland impoundments every 3-5 five years, depending on vegetative conditions, while trying to exclude fire from riparian areas. Hazardous fuels reduction efforts within wetland impoundments adjacent to riparian areas are identified as the highest priority. This is done in an attempt to reduce the potential for catastrophic wildfires occurring in sensitive cottonwood riparian habitat.

Prescribed burns were conducted in Sheppard and Leota Bottoms and there were no wildfires on the Ouray NWR in 2007.

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The “Leota L-10” (#F166) prescribed burn was conducted on March 19, 2007 and burned 163 acres. The test fire was initiated at 1500 and completed at 1510. Ground ignition continued and the broadcast burn was completed at 1700. Objectives were met, as 85% of one hour fuels were consumed. Resources participating this Type 2 burn included two FWS staff (Ouray NWR), five BIA staff (BIA Forestry) and two BLM staff (Vernal Field Office). Blaine Tarbell (BIA) served as RXB2.

The “Sheppard S1” (#F249) prescribed burn was conducted on April 25, 2007 and burned 26 acres. Objectives were met as at least 85% of one hour fuels were consumed. Resources participating on this Type 2 burn included three FWS staff (Ouray NWR and Bear River MBR) and one engine. Vernal BLM provided one Type 4 and Type 7 engine along with five staff. The BIA provided two Type 6 engines and five staff. All BLM and BIA costs were absorbed by their respective agencies.

AFMO  
Tracy  
Swenson  
(FWS)  
served as  
RXB2.



BIA Forestry crew assisted with S1 Rx burn in April.

These prescribed projects were very successful fuels reduction/wildlife habitat enhancement burns, made possible due to a willingness by refuge staff to conduct burns with limited fire staff/funding and assistance provided by the interagency fire community.

Refuge staff (Penttilla and Breakfeld) returned the favor by assisting the BLM and BIA with conducting prescribed burns in the Bookcliffs region in September.

Ouray NWR has an interagency agreement with the U.S. Forest Service, Bureau of Land Management, Bureau of Indian Affairs, National Park Service and Utah Division of Forestry, Fire and State Lands and follows guidelines outlined in the Uintah Basin Interagency Annual Operating Plan (AOP). The purpose of the AOP is to document agreement and commitment to fire protection assistance and cooperation. These activities are primarily coordinated through the Uintah Basin Interagency Fire Center (UBIFC) located in Vernal, Utah. As a participating agency, the Ouray NWR most recently contributed \$2,140 for fire center operational costs on an annual basis. In FY-07, per agreement with UBIFC, Ouray purchased training supplies in lieu of a separate billing for dispatch support (\$1,200).

#### 10. Pest Control

##### Invasive Weeds

There are now six primary non-native plant species of concern. Perennial pepperweed, saltcedar, Canada thistle, Russian olive and Russian knapweed were the original five and now bull thistle has been found in many scattered locations within the Refuge. One lone plant of musk thistle was found (and eliminated) in 2007. In addition, Russian thistle and kochia species pose a problem along roads as vehicle traffic brings in more seeds or picks up seeds on the Refuge. Refuge staff are always on the lookout for a plethora of other species coming down the river including such species as leafy spurge, purple loosestrife, musk thistle, diffuse knapweed, dalmatian toadflax and houndstongue just to name a few.

We currently utilize mechanical, chemical, cultural, and biological control techniques in an effort to gain control of these nuisance species. Prior to 2005, the only biological control agent currently available to us was a soil nematode *Subanguina picridus* for Russian knapweed. This soil nematode has shown very poor success and we have discontinued its use. In 2005, Refuge staff was able to collect beetle larvae from a Utah State University research site in Delta, Utah for control of saltcedar. This beetle, *Diorhabda elongata deserticola*, was originally collected from Kazakhstan. Delta was the only location that beetles from Kazakhstan were tested. Beetles from Fukang, China were tested in other locations above the 38<sup>th</sup> parallel, and is now used in Nevada and Colorado. The closest Fukang beetles being released near the Refuge is on the Colorado side of the Dinosaur National Monument. The Kazakhstan and Fukang beetles have been tested to ensure they are the same species and produce viable young. We will soon find out.

We continue to work closely with the Uintah County Extension Office, Uintah County Weed Department (UCWD), other land management agencies and the Uinta Basin Cooperative Weed Management Area (UBCWMA) in an effort to improve communications and control techniques. As a group we try to work cooperatively to accomplish priority weed control projects and apply for grants.



In conjunction with UBCWMA, as part of an Area-wide weed inventory that has been on-going for several years, the Refuge started a Refuge-wide weed inventory in 2004. The standards were based on work completed at nearby Dinosaur National Monument and Dr. Steve Dewey from Utah State University. Much has already been invested in weed control on the Refuge. But the effort and funds can be most efficiently spent if the exact size and locations of each species of weed is known. In addition, funding and personnel needs can be better expressed by having the knowledge of how big the weed issue is. By completing a Refuge-wide inventory of weeds, the actual weed problem will be known. The vegetation mapping project from 2000 and 2001 did map many of the weeds on the Refuge, but only those weeds that were the dominant species. Therefore, weeds that were not dominant did not show up on the map and fortunately, in many cases the weeds were not the dominant species. Considerable effort was made in 2004 learning the standards and methods to conduct the weed inventory and to setup our Trimble GPS unit. The inventory was started in the north end of the Refuge and worked south staying on the west side of the Green River. Considering 2004 was the initial year and we only had one Trimble, a good chunk of acres was inventoried. (see Table 1). In 2005, an additional Trimble unit was purchased and 4 seasonals and interns were trained in weed inventory mapping. In 2006, only one seasonal and one intern were trained. In 2007, the remaining acres of the Refuge were inventoried and all of Johnson Bottom was re-inventoried. At present, the data from 2007 is being edited and sorted. Hopefully all the data will be combined to complete the final product before spring of 2008.

Table 1. Acres inventoried for weeds in 2004 -2007.

	Acres
2004	3,457
2005	6,100
2006	2,553
2007	2,440

Considerable effort is put into control of all the priority weeds that occur on the Refuge. Table 2 summarizes weed control on the Refuge. Following the table is a summary of 2007's weed control activities.

Table 2. Weed Control Efforts 2004 - 2007

Weed	Type of Control	Chemical	2004 Acres	cut trees	Hours	2005 Acres	cut trees	Hours	2006 Acres
Kochia/Russian Thistle	mowing		21.95		58	30.51		40	85.5
Kochia/Russian Thistle	spot spray	Habitat	12.26		162				
Kochia/Russian Thistle	spot spray	various				1.94		226	
Kochia/Russian Thistle	spot spray	Roundup							0.24
<b>Total</b>			<b>34.21</b>	<b>0</b>	<b>220</b>	<b>32.45</b>	<b>0</b>	<b>266</b>	<b>85.8</b>
Canada Thistle	spot spraying	Plateau	6.39		65	0.1		3	0.12
Canada Thistle	spot spraying	Habitat				0.83		40	0.22
<b>Total</b>			<b>6.39</b>	<b>0</b>	<b>65</b>	<b>0.93</b>	<b>0</b>	<b>43</b>	<b>0.34</b>
Bull Thistle	hand pulled or dug				6				
Bull Thistle	cut flowers							4	1
Bull Thistle	spot sprayed	Milestone							
<b>Total</b>			<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>1</b>
Perennial Pepperweed	boom spray & spot spray	Escort	75.44		273	160.3		1098	21.7
Perennial Pepperweed	wetblade mower	Escort	8.69		90	8.9		52	11.6
Perennial Pepperweed	spot spray	Habitat							0.38
<b>Total</b>			<b>84.13</b>	<b>0</b>	<b>363</b>	<b>169.2</b>	<b>0</b>	<b>1150</b>	<b>33.7</b>
Russian Olive	foliar & cut stump	Arsenal + Roundup	2.7	5	71		67	40	
Russian Olive	cut stump	Arsenal	4	34	68		118	92	0.3
Russian Olive	basal bark	Garlon 4							1.02
<b>Total</b>			<b>6.7</b>	<b>39</b>	<b>139</b>	<b>0</b>	<b>185</b>	<b>132</b>	<b>1.33</b>
Russian Knapweed	boom spray & spot spray	Plateau	53.96		467	60.25		437	80.2
Russian Knapweed	spot spray	Arsenal + Roundup	0.84		16	0.96		10	
Russian Knapweed	spot spray	Arsenal	2.15		28	1.34		10	
Russian Knapweed	mow								10.7
Russian Knapweed	boom spray & spot spray	Milestone							0.4
<b>Total</b>			<b>56.95</b>	<b>0</b>	<b>511</b>	<b>62.55</b>	<b>0</b>	<b>457</b>	<b>91.3</b>

Weed	Type of Control	Chemical	2004 cut			2005 cut			2006 cut			2007	
			Acres	trees	Hours	Acres	trees	Hours	Acres	trees	Hours	Acres	Hours
Saltcedar	roller application	Arsenal + Roundup	46.56		88	41.08		59					
Saltcedar	roller application	Arsenal	1		8	1.73		44					
Saltcedar	cut stump	various	31.3		280	1		20				1.86	18
Saltcedar	foliar spray	Arsenal + Roundup	67.27		410								
Saltcedar	foliar spray	Arsenal				64.31		332	45.9		344	29.89	495
Saltcedar	foliar spray	Habitat				45.53		268	26.02		248	19.79	296
Saltcedar	basal bark	Garlon 4	1.61		40	1.45		54	1.27		142	3.67	246
Saltcedar	bio-control (beetles)							253	0.1		69	0.6	165
Saltcedar	mowing					14.09		29				17.3	22
<b>Total</b>			<b>147.74</b>	<b>0</b>	<b>826</b>	<b>169.19</b>	<b>0</b>	<b>1059</b>	<b>73.29</b>	<b>0</b>	<b>803</b>	<b>73.11</b>	<b>1242</b>
<b>Total Weeds Treated</b>			<b>336.12</b>	<b>39</b>	<b>2130</b>	<b>434.32</b>	<b>185</b>	<b>3111</b>	<b>286.9</b>	<b>30</b>	<b>2446</b>	<b>252.23</b>	<b>3098</b>

In an effort to prevent further spread of weeds, many of our roadsides are mowed on an annual basis, mainly to prevent spread of kochia and Russian thistle. A total of 55.6 acres of roadsides and dikes were mowed in 2007, plus an additional 11.8 acres were mowed in the field north of Parker to assist with reduction of kochia and perennial pepperweed.

A lone musk thistle plant was found on the dike of Wyasket Pond. It was dug out and disposed of. Musk thistle is prevalent in several locations near the Refuge and more of it is expected on the Refuge.

Bull thistle was first discovered on the Refuge in 2004 during the weed inventory. Since that time, additional areas of bull thistle have been found during the weed inventory and while conducting other Refuge activities. Except in a few locations, most of what is found is only a handful of plants, thus making it more difficult to locate. At this point eradication is still considered a possibility and much emphasis was placed in 2007 in finding and eliminating bull thistle. For the first time bull thistle was chemically treated in those areas with larger infestations. Milestone was used and a total of 0.8 acres were treated. In areas with only a few plants, the thistle was dug or pulled out, bagged carefully, and disposed of. Digging out the plant has proven to be very successful in the past as many areas with plants previously dug have not returned. A total of 0.006 acres of thistle were dug out in 15 locations in 2007. As a last desperate attempt to control bull thistle when digging or spraying was not an option, the flowers were cut, bagged and carefully disposed of (flowers will go to seed even after being cut) to prevent further spread of bull thistle. A total of 1.04 acres of bull thistle had the flowers cut in 2007.

It was discovered during the weed inventory that Canada thistle is much more prevalent than previously thought. In addition, past chemical control techniques have not seemed to be as effective as hoped. Until a more successful method of treatment can be found, emphasis in 2007 was placed on searching along the auto tour route for Canada thistle flowers and rosettes and were sprayed with Plateau with a total of 0.33 acres treated in an attempt to control the spread of Canada thistle.

Priority for Russian olive control was to continue to keep the north and south draws, several canals, and all the dikes of Leota Bottom clear of Russian olive. In addition, areas where past control has taken place continued and those included along the auto tour route to push Russian olive trees away from the road, along the dike in S-1 where a new trail is being constructed, and in the uplands of L-4 and L-7. In addition, a few lone or annoying trees were also treated. The two most common methods of control used were cut stump with Arsenal and basal bark treatment with Garlon 4. A small amount of Arsenal + Roundup was used as a foliar treatment and for cut stump treatments. A total of 1.43 acres of Russian olive were treated in 2007.

Perennial pepperweed, saltcedar, and Russian knapweed control consume a majority of our funding and man power resources due to their large infestations and the priority habitats they invade. Due to the considerable expense invested in the control of these weeds, several test plots for each species are currently testing methods for improved treatments. Areas such as the old hatchery site (see Section F-6) and Wyasket Pond are sites with aggressive restoration efforts and contain all three of these weeds.

The restoration in Wyasket Pond started in earnest in 2004 after the thick dry mat of old cattail was burned off. The full extent of how bad the infestations of perennial pepperweed, saltcedar and Russian knapweed could then be seen. Control of these weeds has been a priority since. However, due to the attempts to encourage cottonwood germination, some shallow flooding has also occurred in Wyasket Bottom in 2006 and 2007 limiting the amount of area where weed control could be conducted. In 2007, over 38 acres were treated for perennial pepperweed, which is an increase from 8.7 acres in 2006 due to flooding. In the dry years of 2004 and 2005, over 110 and 145 acres respectively were treated. Saltcedar control has been very successful in the eastern third of Wyasket Pond. Only 1.5 acres were treated in 2007 compared to the same area in 2006 which needed 18.5 acres treated. That area in 2006 actually contained a very large expansion of a newly treated area from 2005. In 2005, a much smaller area required 30 acres of saltcedar control with the initial year of treatment in 2004 needing almost 17 acres of treatment that allowed access for future years for increased saltcedar and perennial pepperweed control. Russian knapweed control in Wyasket Pond dropped considerably from recent years due to the unsuccessful response in past treatments. In 2007 only the test plot and the roadsides were treated.

#### Perennial pepperweed

Perennial pepperweed control also continued in many other locations as well and included the areas adjacent to the entrance roads in both the north and south draws, all the Parker Tracts and the entire area north of the Parker Tracts (which includes a test plot) to the entrance road, the auto tour route to the first river pulloff, the field across the entrance road in front of the office (and continuing to expand eastward in that field), west and south of the old hatchery site, the area around the test plot in L-4 and along that dike, and the area around the test plot in L-7 (also continuing to expand upon). The preferred method of treatment is by using the wetblade mower because it uses the least amount of chemical, can cover large areas very quickly, and is very successful. However, there are very few areas that the wetblade mower can access. Either the terrain is too rough for the mower itself or there are too many obstacles, like saltcedar, in the way. The second preferred method is boom spraying with the tractor or ranger, but once again obstacles in many areas prevent this method. The final method of treatment is spot spraying, which can be reasonably successful but a lot of effort has to be made to find rosettes. Escort was used in all areas except those adjacent to water along S-3.

Four perennial pepperweed test plots continued to be monitored and treated. Each plot is 45 meters by 45 meters square. Within each plot, 15 quadrats are sampled that are 15 meters by 2 meters each. Plot 1 is located north of the Parker Tracts. The treatment in Plot 1 is to mow the area with the first buds, wait until the buds regrow, and then treat with the wetblade mower. The first treatment was conducted in 2004. The only flaws to this plot and this treatment type are that there are large obstacles in this plot, namely down cottonwood trees that prevent a complete treatment with the wetblade mower. In addition, the wetblade mower only treats those plants with flowers, not rosettes, thus allowing the rosettes to grow the following year. So while this method has the least successful control rate of any of the plots (see Table 3) it is very quick to complete and uses very little chemical. Sumpweed is usually quite sensitive to treatments with Escort so the increases in a couple years are unexpected. Results of saltgrass and kochia also remain unclear. Both decreased in 2006 after the second treatment. Many quadrats of kochia went from counting by percent cover to counting stems. But both species increased substantially in 2007. It seems likely that the dry winter and spring in 2006 had more of an effect on saltgrass and kochia than controlling pepperweed did. But overall, saltgrass has increased from 2004.

Table 3. Perennial Pepperweed Plot 1 Results

Species	2004 pretreatment	2005 post treatment	2006 post treatment	2007 post treatment	% change from 2004
perennial pepperweed	13,797	4,828	3,421	2,427	-82.4%
sumpweed	2,945	4,218	523	1,329	-54.9%
saltgrass counted	564	5,511	3,476	6,544	1060.3%
saltgrass mean %	40.0%	33.0%	40.0%	53%	33.3%
kochia counted	0	0	8,990	1,262	
kochia mean %	19.5%	51.4%	12.0%	48.9%	150.8%

Plot 2 is a perennial pepperweed/Russian knapweed mix in Wyasket Pond. It also was established in 2004. Treatments on this site have changed a few times. In 2004 it was boom sprayed with Plateau in early summer in an attempt to treat both weeds at the same time. While successful for pepperweed it basically had no effect on knapweed (see Table 4). In 2005, the plot was spot treated for pepperweed using Escort in early summer and boom sprayed with Plateau for knapweed post frost. The same treatment was applied in 2006. In 2007, it seemed that the effort for spot spraying was not worth it once pepperweed dropped to low numbers so pepperweed was not treated. Knapweed was treated with Milestone postfrost. Sumpweed appears to do better when less Escort is used as in 2006. Identifying grasses by species is difficult in early summer so for comparison purposes for this plot they are lumped. Overall, with the reduction of pepperweed, grasses have increased, though they seemed to have leveled off.



Table 4. Perennial Pepperweed Plot 2 Results

Species	2004 pretreatment	2005 post treatment	2006 post treatment	2007 post treatment	% change from 2004
perennial pepperweed	8,381	461	119	165	-98.0%
Russian knapweed	12,519	13,338	8,161	16,758	33.9%
sumpweed	2,666	4,087	1,204	5,464	104.9%
grass	8,553	(24,801)*	(14,483)*	(14,970)*	75.0%
saltgrass		6,452	9,332	8,943	
wheatgrass		18,349	5,151	6,027	
alkali sacaton bunches		31	47	41	
kochia			137	33,616	

\* saltgrass and wheatgrass combined.

Plot 3 is a wetblade treatment only located in L-7 also established in 2004. Treatment should be conducted at flower bud to beginning flower which is the beginning of June. However, treatment in this plot has not been done consistently. In 2005, it was too wet to access until July which was very late. In 2006, it was questionable whether the pump on the wetblade mower worked consistently throughout the plot. After 2005, this treatment method appears to be quite effective for pepperweed. It also appears to have a significant impact on sumpweed. In 2004, grasses were not separated by species, but has been since. So for comparison purposes, saltgrass is compared to grasses in 2004. While it is difficult to make direct comparisons, after 2004, there were some quadrats that counted saltgrass by % cover because it had become more abundant. Though it seems it has leveled off by 2007. Alkali sacaton has been increasing steadily. Kochia, like all other plots seem to have higher density during wetter years.

Table 5. Perennial Pepperweed Plot 3 Results.

Species	2004 pretreatment	2005 post treatment	2006 post treatment	2007 post treatment	% change from 2004
perennial pepperweed	20,208	13,671	6,337	2,465	-87.8%
sumpweed counted	19,179	9,748	1,344	152	-99.2%
sumpweed mean %	58.3%	37.5%	0	0	-100%
grass	9,294				0.3%
saltgrass counted		12,648	12,716	9,291	
saltgrass mean %		30.0%	29.6%	31.8%	
alkali sacaton bunches		18	23	31	
kochia counted	788	3,773	15,393	3,100	293.4%
kochia mean %		48.0%	25.0%	53.9%	

Plot 4 was established in 2005 following a prescribed fire in L-4. The unit was boom sprayed with the gator using Escort. In remaining years due to the wetness of the area and the lack of pepperweed, it was spot sprayed. Like plot 2, this plot demonstrates how effective boom spraying can be. The negative aspects of boom spraying are the large amount of chemical used, the treatment of desirable plants such as sumpweed, and the difficulty of access of larger equipment. However, the disadvantage of spot spraying is that rosettes are not being treated and often show a slight increase of pepperweed as in 2007. Saltgrass was counted in 8 of 15 quadrats in 2005. By 2006, the saltgrass had increased so much in those quadrats that all had to be counted by percent cover. Saltgrass has been increasing steadily each year while alkali sacaton has been decreasing. Perhaps the area has been too wet for alkali sacaton. *Juncus balticus* increased some in 2006 and returned to 2005 density in 2007. Kochia increased as it has in all plots.

Table 6. Perennial Pepperweed Plot 4 Results.

Species	2005 pretreatment	2006 post treatment	2007 post treatment	% change from 2005
perennial pepperweed	11,942	202	399	-96.7%
sumpweed counted	14,832	905	1,381	-90.7%
saltgrass counted	13,921			
saltgrass mean %	24.3%	36.0%	67.3%	177.3%
alkali sacaton bunches	456	349	274	-39.9%
kochia counted	109	1,405	82,047	75,172.5%
<i>Juncus balticus</i>	2,677	3,028	2,714	1.4%
halogeton	32			-100%

Utah State University (USU), Department of Plants, Soils, and Biometeorology under Dr. Corey Ransom established 24 test plots in L-7 in 2006 to test 12 different chemical treatments at two times of year. The plots were treated in 2006 and monitoring was conducted in 2007. See Section D5 for more details.

#### Saltcedar

Saltcedar continues to be our biggest investment in weed control (see Table 2). The reasons for this larger investment is that the Refuge has a large number of acres of saltcedar, there are more ways to treat saltcedar than other weeds, a much longer time period when saltcedar can be treated, and saltcedar is more of a threat to our priority wetlands. After initiating large new areas of saltcedar control in 2003 - 2005, we ran into trouble in 2006 by not being able to cover all that ground for re-treatments due to a smaller staff and an early Russian knapweed season. In 2007, emphasis was placed on keeping up with re-treatments, keeping 'clean' areas maintained, and expanding on those areas within our limits.

Areas that were maintained by foliar spray and are in good condition include the north and south draws from the north boundary fence to the Parker Tracts, from the entrance road to the Parker Tracts, the Parker Tracts, S-4, the auto tour route to the first river pull-off, from the auto tour route along the north side of the farm fields through the old hatchery site, much of the hatchery canal in Leota Bottom, the dikes along the center canal and between units from L-3 through L-6, the northwest quarter of L-4, the part of Johnson Bottom previously treated, and the section of Wyasket Pond previously mentioned. L-10 also was re-treated with foliar spray, but required more attention than last year due to new infestations of saltcedar. Ten acres of new growth saltcedar was mowed in hopes of being controlled by flooding in 2008. These areas will continue to be priority as much has already been accomplished and less maintenance will be needed in the future if we continue to be vigilant.

A few areas were treated using Garlon 4 as a basal bark treatment. A section of dike along L-3, the dike between L-3 and L-5, and the west and south dikes of L-9 were re-treated using basal bark. Work also continued in the new area initiated along the Green River on the northwest end of the auto tour. Those saltcedar trees are quite large and it may take a few years to get into and through them all. The area around pepperweed plot 3 in L-7 was maintained and expanded upon using both basal bark and foliar treatment.



The area east of the farm fields, from the old hatchery site to S1a was an expanded area for 2007 that required minimal treatment. Foliar treatment was used on small or single saltcedar and one larger area of saltcedar was treated using basal bark treatment. Treatment of this site now connects two previously treated areas.

Areas that were treated in years past that we struggle to keep up with re-treatments are S1a, S-5 and L-4. S1a had a large area mowed in 2003 with followup treatments of foliar spot spray treatments and roller applications. The roller applications were minimally successful and could not be continued in 2006 due to the saltcedar becoming too high or the new regrowth was too short. In 2007, a large area north of the test plots was retreated, including a very large area not completed in 2006. However, a large area south of the test plots that had been treated in 2005 was not treated in either 2006 or 2007. In 2005, a large area was mowed in S-5 and the regrowth treated with roller applicator. Once again, that treatment method could not be continued. A fairly large part of the original area was foliar treated in 2006, but due to excessive destruction of desirable grasses that method was not used in 2007. Instead, basal bark treatment was used in hopes that it would be gentler on the grasses. This treatment also included an area that basal bark was applied by hand on small, new growth saltcedar that hopefully will not affect grasses at all. In 2005, an area was foliar treated in the northeast quarter of L-4 following a prescribed fire. That area has not been treated since due to the inability of getting ATV's into the area because it is too wet.

The only new area of treatment was along the north side of S-1. This was needed so that a new hiking trail could be constructed. The saltcedar was cut and the stumps treated. Another new area of treatment was on the north side of L-9 where a large area of new growth saltcedar was coming up. The area was mowed in hopes of it being flooded out in 2008.

Seven test plots of saltcedar were monitored in 2007. Plots 7 and 8 started out as test plots for low volume roller application. But after two years of treatment the old stems of saltcedar were too tall and thick for the roller applicator or there was new growth from the root crown that was too short. So in 2006, foliar spot spray was applied to the two plots using the same rate. Monitoring will continue to further test the results of foliar spray and once the saltcedar is dead the plots will be used to test mowing of saltcedar. After one year of foliar spraying on both plots, some new regrowth from the root crown continued. Perennial pepperweed decreased some while Russian knapweed decreased significantly. However, kochia continued to increase dramatically. Saltgrass, which handled the roller application treatments went down in most quadrats of the plots, but increased significantly in a few quadrats. Alkali sacaton increased in one plot but decreased in the other. Poverty had increased each year of roller applicator treatment but dropped considerably after one year of foliar treatment. With many quadrats with little to no live saltcedar left, it will be interesting to see in the future if some of the desirable plants recover as the amount of treatment goes down.



Plots 9 - 12 were low volume test plots of foliar spray treated in 2004. In the past foliar applications were always 1% Arsenal + 1% Roundup. But with the success seen using ultra-low volume rates with the roller applicator, foliar test plots were set up. Plot 9 was 1% Arsenal, plot 10 was 0.5% Arsenal, plot 11 was the standard 1% Arsenal + 1% Roundup and plot 12 was 0.125% Arsenal. All plots had 100% control of saltcedar. Plots 10 and 11, which used the most chemical, had large dead areas of understory. Plot 12 had the least amount of dead understory. This demonstrates that foliar treatment is very toxic to understory whether it is caused by drift or from uptake from the saltcedar plant. Two years after treatment, the dead areas under the saltcedar have decreased in plots 10 and 11, were still somewhat visible in plot 12 and were basically gone in plot 9. In 2007, three years after treatment, the rings of dead areas have all finally disappeared. And though there was very little grass present prior to the treatment, three years after the treatment, none of the grass had returned. As a result of these test plots the standard mix for foliar application for saltcedar was changed from 1% Arsenal + 1% Roundup to 0.25% Arsenal which is still double the volume used in plot 12 but half the amount of plot 10. The lowest volume may be too low if treatment is rushed (which frequently happens when treating day after day).

Two plots had been set up in recent years to test the viability of basal bark treatments using Garlon 4. The advantages to the basal bark treatment is that it is allowed in close proximity to water up to a certain total active ingredient percentage of the wetland, can be used on the largest saltcedar that is unreasonable to treat with foliar treatments or too big for other treatment types, can be done in areas that is difficult for equipment to access such as mowers, and can be done in late fall when there may be less effect on the understory. Plot 19 was initiated in 2005 using the same volume of chemical as former plot 18 which showed that Garlon 4 can be used at half the label recommendations. However, the treatment date was later in the fall than plot 18 and a better method of counting stems was used so monitoring could continue long term to see if the understory is less impacted with a later fall treatment. This plot also contained Russian olive which

was treated and monitored. The plot was first treated with Garlon 4 at 2.5% on 10/28/05. The same treatment was planned for 2006 but was the saltcedar was accidentally foliar sprayed during the summer. None of the Russian olive was treated in 2006. In 2007, remaining live stems of both saltcedar and Russian olive were treated with basal bark on October 29.

After the first treatment, 31% of the saltcedar and Russian olive were completely killed. After the foliar spray treatment, 61% of the trees were now dead. After the first year, an additional 58 % of the trees had some stems killed with only 8% not showing any sign of kill or stunting. After the foliar treatment, a total of 91% of the trees were either dead or had some stem kill with only 5% of the trees not showing any sign of kill or stunting. Some of the saltcedar and Russian olive are very difficult to access so have not been adequately treated if treated at all.

After the first year of treatment, the understory was not damaged too severely. Bare ground only had a slight increase. Perennial pepperweed decreased by 34%. Grasses with a density over 50% did decrease, but when combined with all grass categories increased overall. The presence of cattail/bulrush, smartweed, mallow and poverty weed increased. Canada thistle stayed about the same with slight decreases in sow thistle and dogbane. After the foliar treatment, bare ground increased significantly. All other species decreased sharply except for Canada thistle and poverty weed. Many willows were also inadvertently treated, killing some and stunting many.

Four release sites were established for the biological control of saltcedar using the beetle *Diorhabda elongata deserticola*. As stated earlier in this section, Refuge staff was able to collect beetle larvae from Delta, Utah. Seven staff members spent a morning collecting larvae (the first generation of the year) and brought them back to the Refuge and released them on June 23, 2005.

The four release sites were Johnson Bottom, L-3, Wyasket Bottom, and S1a. Each clump of saltcedar that the beetles were released in was tagged, a GPS coordinate collected, and a photo taken. In addition a monitoring protocol was established which at this time consists of counting adults, the three stages of instar larvae, and egg masses during a specified time period. A damage category was added to the monitoring in 2006.

In 2005, the first official monitoring was conducted on September 1. Larvae had been seen on August 1 at one site and since we were told to expect two generations a year, it was expected that on September 1, only adults would be found. Surprisingly, only larvae were found on September 1 possibly meaning that three generations had been produced in 2005. Larvae were found on every release bush at three of the release sites. However, at L-3 larvae could not be found on several of the bushes.

In 2006 and 2007, monitoring was conducted three times each year - see Table 7. The timing of the monitoring was planned in an attempt to coincide with peak larvae numbers as they are the easiest to count. In 2006, neither beetles nor larvae were found in L-3. S1a was very disappointing after ending 2005 with such high numbers. Wyasket had a decrease from 2005 but at least maintained a consistent level throughout the year. Johnson Bottom had an explosion of larvae in August that by September had resulted in complete defoliation of one release bush, severe damage to another and some obvious defoliation to the rest. Once again, only larvae were found in September which may mean that we are getting three generations. Why there was such a difference in populations of beetles between the sites is unknown.

In 2007, the first beetle monitoring followed what had occurred in 2006 except that at Johnson Bottom the original release bushes had become so defoliated that the beetles had moved to surrounding bushes of saltcedar resulting in lower than expected numbers on the release bushes. On August 14, 5 staff members collected beetles from BLM land along a tributary to the Colorado River north of Moab, Utah. Almost 24,000 beetles and some larvae were estimated to have been collected. All were released in S1a in an attempt to establish one strong population in an easily accessible site. Many experts believe that releasing in one site helps attract former released beetles back to the site with the pheromones that are emitted during mating season resulting in higher production rates.

Table 7. Results of saltcedar beetle monitoring

	Number of adults or larvae counted						
	2005	2006			2007		
	9/1	6/29	8/11	9/6	6/27	8/16	9/11
L-3	31	0	0	0	0	0	0
S1a	208	68	5	12	1	447	32
Johnson	38	39	725	19	52	234	12
Wyasket	54	15	14	19	18	285	45



Myah Nelson releasing beetles. (DA)



The August monitoring survey found good results at S1a, but were actually expected to be higher. Hopefully the beetles are just moving somewhere else as

they have done at other places in Utah and Colorado. The numbers at Johnson Bottom were pretty good, but complete defoliation was eminent and many beetles could be seen on surrounding bushes. The high population at Wyasket Bottom was a nice surprise. The highest concentration of beetles were mainly on three bushes and hopefully they will stay that way and continue to increase. The September monitoring was very disappointing at all sites except Johnson Bottom. It is unknown if the timing of the survey was off or if all the populations did drastically drop. At Johnson Bottom an area of complete to almost complete defoliation was GPS'd and totaled 0.5 acres. See Figure 1.



• Johnson Bottom Beetle Release Site 0 225 450 900 Feet

Complete to severe defoliation of saltcedar by beetles released June 23, 2005. Size of defoliation is 0.5 acres, mapped 9/11/07.

Figure 1. Saltcedar beetle

defoliation

### Russian Knapweed

Russian knapweed is sometimes considered the most persistent of all the weeds affecting Ouray NWR. It grows in such thick patches that all other plants are virtually eliminated and unfortunately Russian knapweed also seems to be the most difficult to treat. Treatment types are still being tested to find one that works well. Even the surfactant used is being tested.

There are several priority areas of Russian knapweed control. Including Wyasket Pond and the old hatchery site which were already mentioned earlier, the other priority sites are along the entrance road from the north and south draws to the auto tour route, down the auto tour route through the Parker Tracts, and the areas north of the farm fields.

Frustration continued in 2007 with dismal results in Russian knapweed control. The extra effort in 2006 of mowing the Russian knapweed at the old hatchery site at flowering and then treating in the fall did not reduce the knapweed at all. A new chemical, Milestone, states on the label that it is effective for treating Russian knapweed at flowering and had apparently worked at other locations, so 2.5 acres were boom sprayed with Milestone on June 9. It was not a successful treatment. Furthermore, after monitoring the many test plots, it became apparent that the use of Plateau had become ineffective. More discussion on those results are below. Fortunately, the two new test plots established in 2006 using Milestone post frost were quite effective. Thus all the general spraying, essentially all the areas not associated with a test plot, was switched to Milestone except for the old hatchery site which had already been sprayed with Milestone once. It had to be sprayed in the fall with Plateau. Due to questionable success of spraying, fewer acres were sprayed in 2007 - see Table 2.

Testing of different chemicals and timing of spraying in an attempt to find successful methods of control of Russian knapweed has been ongoing since 2000. The timing of the treatment seems to be a big factor in the



success of the treatment. A successful prefrost treatment is highly desired so that the treatment season would be extended. Treating post frost creates a very short window of treatment before the plants go totally dormant. In 2003, several of the plots were resurrected because either they were unfinished or showed very good potential. Additional plots have since been added. Two plots were dropped after monitoring in 2006. One of those plots used Arsenal and the other an Arsenal + Roundup mix. While they were very successful with control of Russian knapweed, it is known through saltcedar work that even with spot spraying, desirable plants such as saltgrass would be significantly affected using these chemicals. Better options needed to be found. Table 8 shows the results of the rest of the current plots but only the effect on Russian knapweed. The other plants in the plot are not listed in this table.

Table 8. Summary Table of Russian Knapweed Treatment Plots

Plot # & Treatment Description	Russian knapweed counted alive + dormant					2004%	2005%	2006%	2007%
	2003	2004	2005	2006	2007	change	change	change	change
						from pretrm nt	from pretrm nt	from pretrm nt	from pretrm nt
Plot 1 - Prefrost Plateau 8 oz/ac + Hasten	259	269	269			4%	4%		
Plot 7 - Prefrost Plateau 8 oz/ac + S-90		71	66	9	26		-7%	-87%	-63%
Plot 1 - Post frost Plateau 12 oz/ac + Hasten			269	201	204			-25%	-21%
Plot 10 - Post frost Plateau 8 oz/ac +	89	102	61	41	38	15%	-31%	-54%	-57%

46

Hasten

Plot 13 - Post frost Plateau 8 oz/ac + S-90	41	17	34	30	-59%	-17%	-27%
PP Plot 2 - Post frost Plateau 8 oz/ac + S-90	13338	8161	16758			-39%	26%
Plot 14 - Post frost Milestone 6 oz/ac + S-90		138	2				-99%
Plot 15 - Post frost Milestone 6 oz/ac + LI-700		157	9				-94%

Plot 1 was initially a pre frost plot of Plateau at 8 oz/ac + Hasten spot spraying. After two years of treatment, there was no change in Russian knapweed so the plot was changed to a post frost treatment of Plateau at 12 oz/ac + Hasten boom spraying wherever possible. This plot has a ditch that runs through it and makes access with boom sprayers difficult. Wherever the boom sprayer could not spray is spot sprayed consistently to resemble boom spraying. There was a 25% decrease in Russian knapweed after the first year of spraying but only a 21% decrease from pretreatment after the second year of treatment. In 2007, this plot was changed again to pre frost Milestone 6 oz/ac + LI-700.

Plot 7 is also a pre frost test plot of Plateau at 8 oz/ac + S-90. After two years of treatment, the Russian knapweed decreased by 87%, but the next year, 2007, it increased to a 63% reduction in knapweed from pretreatment. In 2006, the plot was treated post frost due to an early, unexpected frost. So it is unknown whether it was the timing of the treatment that resulted in the increase of knapweed or if like other plots, Plateau just no longer works. This is also one of the few plots with decent growth of desirable grasses and Plateau does not seem to inhibit grasses.

Plot 10 was a post frost plot of Plateau at 8 oz/ac + Hasten. After an initial increase of Russian knapweed after the first year of treatment, the next three years saw a steady decreases of 31%, 54% and 57% from pretreatment. Like many other areas with thick knapweed, other ground cover species are lacking so it is difficult to see effects on those other species, though wheatgrass and mallow are present within the plot. Although this plot is seeing a decrease of knapweed, it is not sufficient enough for the effort. In 2007 it was changed to post frost Milestone at 5 oz/ac + LI-700.

Plot 13 was a post frost treatment with Plateau at 8 oz/ac + S-90. The plot had a 59% decrease in knapweed the first year after treatment but in 2006, the knapweed doubled from the year before. Except for knapweed, this plot is mainly bare ground. Kochia barely grows in this plot, unlike everywhere else on the Refuge. In spring of 2006, the area within and nearby the plot was seeded with native grasses. The knapweed was already present and so was knocked down and raked in

with the grass seed, which may have resulted in an increase in knapweed. Unfortunately the grasses have not germinated. In 2007, there was little change in the amount of knapweed but due to its vicinity to the old hatchery site that had to be sprayed with Plateau the same treatment continued in this plot.

The perennial pepperweed plot 2 has also been treated post frost with Plateau at 8 oz/ac + S-90 but most of the plot has been treated with a boom sprayer. This plot has been intensively grazed (probably by horses) since late 2005 or early 2006. So the knapweed is often bushier than normal, which would increase the stem counts during monitoring. Even so, there was a decrease in knapweed after the first year by 39%. However, the bushy knapweed increased significantly after the second year of treatment. Luckily, the grasses in this plot have been consistent. In 2007, the treatment on this plot was changed to Milestone 5 oz/ac + S-90.

Plots 14 and 15 were initiated in 2006 using Milestone at 6 oz/ac. But plot 14 uses the surfactant S-90 while plot 15 uses the surfactant LI-700. Both plots showed good success in reducing Russian knapweed. Plot 14 had a 99% decrease and plot 15 had a 94% decrease. Unlike Plateau, Milestone does not seem to have an effect on perennial pepperweed. In plot 14 the pepperweed stayed the same but increased in plot 15. Combining saltgrass and wheatgrass (since they can be hard to differentiate), the grasses increased by 25% in plot 14 but decreased by 36% in plot 15.

Plot 16 was initiated in 2007 after hearing of success with using Milestone way past dormancy. This plot was treated on November 7 with Milestone at 5 oz/ac + S-90.

#### 10a. Mosquito Control

Refuge staff continued to work cooperatively with the Uintah County Mosquito Abatement District (UCMAD). The primary concern for 2007 continued to be the possibility for a large outbreak of West Nile Virus. The Refuge had confirmed West Nile Virus in one mosquito sample in 2003, two mosquito pool samples in 2004, five samples in 2005, and two pool samples in 2006. But in 2007, no samples tested positive. This is attributed to dry conditions on the Refuge and

successful treatment of mosquito larva with Bti. That does not mean that West Nile Virus was not in the area; positive samples were found just north of the Refuge near Pelican Lake. Fortunately so far West Nile Virus has had a low incidence of human and horse impact. We theorize that it is a matter of ‘when’, not ‘if’ there is a major virus outbreak in Utah and continue to take a proactive approach to soften its impact. Our proactive approach consists of training, communication, revisiting our water management regime, completing a set of guidelines to direct action as part of our IPM plan and evaluating what other pesticides could be utilized while maintaining compatibility. In addition to West Nile virus, the potential still exists for mosquito-borne Western Equine and St. Louis Encephalitis to occur.

The Refuge continued its traditional means of mosquito control by issuing a Special Use Permit to the UCMAD. The UCMAD maintains a light trap on the refuge. Mosquitoes are collected weekly from the trap and sent in for disease pathogen testing. Mosquito larvae are randomly sampled by UCMAD and when larvae are present a larvicide is applied. The primary control method is the use of Bti (*Bacillus thuringiensis israeliensis*) mosquito larvicide applied both aerially and from the ground by ATV. In addition, two chicken sentinel flocks are also maintained by UCMAD in the county and are tested routinely for disease pathogens.

UCMAD conducted three aerial applications of Bti on May 21, May 24, and May 25, totaling 4,080 acres. Ground applications of Bti were conducted on only four occasions from May 30 through July 17. There were no applications of mosquito adulticides applied on Ouray NWR in 2007.

#### 11. Water Rights

Ouray NWR holds water rights from the Green River for 139.06 cfs for fish and wildlife propagation and 6,185 acre-feet for irrigation, for a total of 23,452.12 acre-feet. These water rights are commingled and can be used anywhere between a point N 130° 24' W 2167.8 feet from the SE Corner Section 24, T7S, R20E, SLB&M and a point E 2175 feet and S 3000 feet from the NW Corner Section 22, T8S, R20E,

SLB&M. The Green River is the Refuge's primary water source, diverted through five gravity-flow inlet structures, four levee removal sites and portable pumps. The use of permanent pump stations on the Refuge is being phased out over time as prescribed under the station CCP.

Ouray NWR also holds 860 shares of Pelican Lake water. The amount of available water per share varies each year and ranges from 1.5 to 3.0 acre feet/share. This water is diverted through a gravity-flow pipeline and used to irrigate refuge croplands and supply water for impoundments in the Parker Tract, Sheppard and Leota Bottoms. Pelican Lake water use is managed by the Ouray Park Irrigation Company. A Change Application has been submitted to the Utah State Engineer, Division of Water Resources through OPIC (pending) to modify time and place of use, but will not result in an overall expansion of use of the water rights. This Change Application was still pending by the end of 2007.

"Free" water (no water rights) is also received from seeps and excess irrigation water from private agricultural operations above the Refuge and flows through the Roadside Draw. This water has elevated selenium levels and now flows freely towards the Green River through S-5 as a result of levee removal projects in S-3 and S-5.

To protect refuge water rights, steps are being taken to improve water use information. Calculations of water use at Ouray NWR have always been a challenge. In the past, pump and pipeline water use was easily calculated but measuring Green River gravity flow water was difficult with no flumes in place. Estimates were derived by recording changes in staff gauge readings and accounting for evaporation. Information derived from these calculations was speculative, as there were no area/capacity tables developed for refuge impoundments at the time and the short staff gauges in use did not adequately measure the full range of changes in water elevations.

As a first step towards improving the accuracy of water use calculations, FLO Engineering, Inc., was contracted by FWS Water Resources Division (WRD) in July 1997 to investigate elevation/area/capacity quantities for six bottomland sites on the

Refuge. “The objectives of the study were to: 1) Determine the accuracy of existing topographic mapping of the bottomland sites. 2) Collect topographic survey data where the existing mapping was not sufficient to determine appropriate bottomland areas and capacities. 3) Prepare mapping for each bottomland site from the existing topographic data and collected survey data. 4) Process Elevation, Area, and Capacity information in tabular format in order to quantify water use on Ouray National Wildlife Refuge.”

The Bureau of Reclamation (BOR) under contracted with WRD, constructed Parshall flumes adjacent to gravity-flow inlets in Leota (1997), Sheppard (1997) and Woods Bottoms (1998). However, levee removal projects designed to restore natural flooding in Leota (1998), Johnson (1998) and the backside of Woods Bottoms (1997), added new complexities to water use measurements. To address this issue, full-length staff gauges were installed by Refuge staff in all impoundments and surveyed by the BOR late in 1999.

WRD personnel also developed Excel spreadsheets to aid water use calculations. A recent development that has come to light while utilizing these spreadsheets, is the apparent discrepancy between surveys conducted by the BOR and FLO Engineering (now called Tetra Tech). The BOR conducted their surveys based on USGS benchmarks but it is unclear what FLO used for control points.

This issue was examined by Tetra Tech (TT) personnel in 2003. Under USBR Contract No. 00-CA-30-0027, TT performed a static GPS survey to establish a network of horizontal and vertical coordinates throughout the entire Refuge. The network was used to update the existing survey information for all units except Wyasket. Wyasket was the only bottomland not tied into the BOR survey during FLO’s 1997 survey (it was tied into 1962 topography maps).

Existing topographic maps, elevation/area/capacity tables and cross section data developed by TT on arbitrary datums were updated to correspond with the new survey datum and submitted electronically on a CDROM (Cost \$10, 950).

Under the 2003 contract, TT also conducted a topographic survey of Wyasket Pond and Lake (2000 acres). A topographic map of the entire Wyasket Bottom was completed along with updated elevation/area/capacity tables for the site. Data was be submitted electronically on CDROM (Cost \$13,865).

In October 2004, TT contract data was submitted to the R-6 WRD to be developed into new spread sheets. There is a need for staff gauges not surveyed in the TT contract to be surveyed to make full use of the revised spread sheets.

In 2001, Intermountain Environmental, Inc.(IEI), Logan, Utah was contracted by WRD (\$43,188) to install Campbell Scientific data-loggers equipped with radios to remotely monitor water levels in all Refuge impoundments. IEI installed these units in Sheppard S-1 thru S-5 and the Woods Main/Backside impoundments. Stilling wells for these structures were constructed and surveyed by the BOR prior to IEI's arrival in 2001. In 2002, Refuge staff installed stilling wells and data-loggers at L-6 and L-8; however, problems were encountered with radio communications which needed to be resolved. In 2003, radio communications problems were resolved with the exception of Woods Main. Two more stilling wells were installed at the L-2 and L-4 drains in 2004. Contract work with IEI continued in 2005including modifying the radio system to narrow band and in installing a repeater on the bluffs northeast of HQ in 2005 (\$1800). Service contract work continued with IEI in 2007 and included installing water measurement equipment at L-2 and L-4, converting Sheppard and Leota Master sites to shaft encoders, converting the slave site at Woods Main to a Master site and replacing batteries at L-2, L-4 and Woods Main. As a result, all sites were communicating except S-2 by July 2007. IEI service costs were covered by Water Resources in 2007 (\$3,190, PO 60181P662).

## **G. WILDLIFE**

### **1. Wildlife Diversity**

The bountiful diversity of wildlife within Ouray NWR is a direct result of the various habitat types, available water and the safe haven provided by the Refuge. The Refuge has often been referred to as an oasis in the desert. Lands adjacent to the Refuge are very dry and barren.



*Eriogonum shockleyi*, Shockley's buckwheat. (Shauna Melius)

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fu

ge staff have listed 237 bird species, 8 additional bird species listed as accidentals, 57 mammal species, 21 reptile, 6 amphibian species, 29 fish species, 24 butterfly species and 315 plant species occurring on the Refuge.

## 2. Endangered and/or Threatened Species

Federally endangered or threatened species that can occur on the Refuge include razorback sucker, Colorado



the

pikeminnow, bonytail, humpback chub and Uintah Basin hookless

cactus. Bald eagles were delisted in 2007 and more information on eagles can be found in G6. The Uintah Basin hookless cactus can be found in several locations on the Refuge, mainly on gravelly, south and west facing slopes. There is currently a proposal to split the species *Sclerocactus glaucus* into at least 3 species. The cactus found on the Refuge would become *Sclerocactus wetlandicus* and may no longer be listed as T & E.

The southwestern willow flycatcher is listed as a Federal Endangered Species. Differentiating between the southwestern willow flycatcher and the willow flycatcher is extremely difficult. Determinations by vocalizations are not accepted by most. It is somewhat assumed that the southwestern willow flycatcher is not found on the Refuge. See section G7 for more information on willow flycatchers.

The yellow-billed cuckoo is listed as a Candidate species on the Federal Endangered and Threatened List. The cuckoo has known to nest on the Refuge. See G7 for more information on yellow-billed cuckoos.

The State of Utah no longer maintains a State Threatened and Endangered Species list. Instead the State has compiled a Species of Concern List which includes the following that occur on the Refuge: American white pelican, bald eagle, burrowing owl, ferruginous hawk, Lewis's woodpecker, long-billed curlew, short-eared owl, smooth greensnake, and white-tailed prairie dog.

### 3. Waterfowl

The General Avian Survey (GAS), which has been conducted for many years, is in the process of being overhauled to provide consistent data for monitoring, use on individual impoundments, and to estimate populations for the entire Refuge. This process started in 2004 which happened to be a very dry year and may serve as a benchmark for one of the lowest spring and summer population estimates.

Although 2005 was the wettest year, with the most area flooded of any of the years shown in Table 9, 2005 was quite dry in early spring, while 2006 started the year with many units flooded. In spring of

2007 there was water in several units, but as the summer progressed only a handful of impoundments had any water. In 2004, duck use was exclusively on the Green River while in 2005, most of the fall duck use was in Sheppard Bottom with very little use on the Green River. In 2006, the peaks and use was scattered with mallard peak was in February on the Green River, the teal peaks were in March in Sheppard Bottom, and the gadwall peak was in August with the majority of birds found in S-5, L-8, and Woods Main. The fall peak was quite low with most of the birds found in Sheppard Bottom and very few found on the River or Leota Bottom although there was water.

In 2007, the majority of the spring use occurred in Sheppard Bottom mostly in S-3 and S-5 even though there was water in much of Leota Bottom. The peaks of green-winged teal and pintails occurred in March, shovelers in early April, and gadwalls in May. The cinnamon teal peak was early July with a most teal found in L-5 as it was drying up with cinnamon teal use on the Refuge dropping off sharply after that instead of building to a larger fall peak. Mallards peaked in October with very little use found in any of the bottoms by any birds due to low or no water and most birds found on the Green River. Redhead and ruddy duck peaks are usually in the summer during nesting season; however, with water levels dropping quickly during the summer, the peak for both birds was in May. Canada goose numbers were low throughout the year compared to other years with the peak occurring in June instead of either spring or fall migration.

Table 9. Peak numbers of core duck and goose species.

Peak numbers for	2004	2005	2006	2007
Spring dabbling ducks	3,360	5,311	11,630	8,013
Fall dabbling ducks	10,519	8,498	4,485	2,158
Mallard	3,095	3,780	10,519	1,685
Gadwall	740	2,379	5,680	3,064
Northern pintail	1,104	2,274	2,144	3,592

Green-winged teal	5,798	2,312	5,418	3,223
Cinnamon teal	319	1,324	752	565
Northern shoveler	485	510	441	450
Redhead	309	594	532	243
Ruddy duck	133	287	297	127
Canada geese	2,180	4,133	3,587	2,389

Several other species besides those listed in Table 3 are routinely seen during the year and include American wigeon, blue-winged teal, wood ducks, buffleheads, ring-necked ducks, lesser scaup, common goldeneye, and common mergansers. Tundra swans are seen yearly but only a few and usually for only a week or two. The unusual waterfowl sightings of the year were canvasbacks and hooded mergansers in March and April with the canvasbacks found in S-3 and the hooded mergansers in L-9, and a snow goose seen in November in the farm fields.

Brood production on the Refuge can be inconsistent and spotty as the river may flood units late in the nesting season flooding out most nests followed by many units that dry up during the summer. In 2007, very little flooding occurred and units started to dry up the end of June with several totally dry by the end of July. In 2007, 11 mallard broods were identified in the survey area (estimates are not done for the whole Refuge) producing 60 young. This compares to 11 mallard broods found in 2006 and 6 broods found in 2005 and 2004. A total of 21 gadwall broods were found producing 122 young compared to 29 broods found in 2006, 34 in 2005, and 38 found in 2004. Eleven redhead broods were seen in 2007 producing 19 young compared to 15 broods in 2006, three in 2005 and two in 2004. Five ruddy broods were found for a total of 16 young with six broods counted in 2006, four in 2005, and five in 2004. Eleven Canada goose broods were counted with 48 young compared to 12 broods in 2006 and only 5 broods in 2005 and 2004. Canada geese have been noted to nest in the constructed nesting structures placed in many of the impoundments, but several nests in 2007 were also seen in trees. Also

found in 2007 were three broods of cinnamon teal, one blue-winged teal, and three wood duck broods.

#### 4. Marsh and Waterbirds

The secretive marsh bird survey was initiated in 2001 by David Klute, Assistant Nongame Migratory Bird Coordinator. Klute also conducted the survey in 2002, though only in Leota and many of those points went dry by the end of the survey period due to drought. The survey was revived by Refuge Staff in 2004. Data from this survey will be used by the Refuge and as part of a national database. The Leota route has 15 points and has been conducted 2004 - 2007, though at the start of 2005 and during 2007 some of the points were dry. The Sheppard route has 10 points and was only conducted in 2005 - 2007 due to dry conditions in 2004. From 2005- 2007, four surveys were conducted on each route instead of three. This was to answer whether American bitterns are setting up territories earlier than previously thought. Primary species surveyed were the least bittern, sora, Virginia rail, and American bittern. Secondary species were red-winged blackbird, yellow-headed blackbird, marsh wren, common yellowthroat, and willow flycatcher. David's list of primary and secondary species was much longer, but most of the species dropped in 2004 were surveyed using the General Avian Survey. Results from the survey can be seen in Tables 10 & 11.

Table 10. Peak number of birds detected on Leota route. NS - not surveyed.

	2001	2002	2004	2005	2006	2007
American bittern	9	8	13	11	14	11
Common yellowthroat	13	5	7	9	12	13
Least bittern	0	0	1	0	0	0
Marsh wren	NS	NS	22	38	32	38
Red-winged blackbird	NS	NS	19	30	17	21
Sora	1	1	3	1	7	1

Virginia rail	1	4	6	5	6	4
Willow flycatcher	0	0	0	1	2	4
Yellow-headed blackbird	NS	NS	43	49	30	15

Table 11. Peak number of birds detected on Sheppard route. NS - not surveyed.

	200 1	200 5	200 6	200 7
American bittern	13	7	5	6
Common yellowthroat	5	11	5	8
Least bittern	0	0	0	0
Marsh wren	NS	10	11	19
Red-winged blackbird	NS	22	25	22
Sora	1	3	5	1
Virginia rail	0	3	7	5
Willow flycatcher	0	0	1	1
Yellow-headed blackbird	NS	34	34	15

American bitterns continue to be seen as often as heard and the Refuge has become known as a place to reliably see American bitterns. On a national scale, the number of American bitterns recorded/number of points surveyed is one of the highest in the nation. In 2007, much of Leota was dry or was going dry during the survey. In Sheppard Bottom, S-1 was dry and S-2 was going dry, but the rest of the units had water. With the dry conditions, lower numbers were expected. However, while it appears there were more marsh wrens during dry conditions, a close look at the data reveals that the wrens are in higher numbers only at the wet points. Maybe the tight conditions make them noisier. Common yellowthroats or willow

to mind  
they  
units  
drop in

Pied  
grebes  
Refuge  
Clark's  
Refuge  
All



flycatchers did not seem  
the drier conditions as  
were found in both drier  
and wet ones. The large  
yellow-headed  
blackbirds unexpected.

billed, eared and western  
are all common on the  
during breeding season.  
grebes also nest on the  
but are not as common.  
species of grebes were

much lower in 2007, comparable to 2004 which was another year with very little water - see Table 12. Production of grebes was also low in 2007. No broods of Clark's grebes or eared grebes were found and only 11 pied-billed grebe broods and 6 western grebe broods were seen. Grebe broods were only found in Leota Bottom. In 2006 there were 3 Clark's grebe broods, 28 eared grebe, 45 pied-billed grebe, and 55 Western grebe broods found. In 2005, grebe brood totals were 2 Clark's grebes, 7 eared grebes, 18 pied-billed grebes, and 33 western grebes. In 2004, there was 1 Clark's grebe brood, 1 eared grebe brood, 19 pied-billed grebe broods, and only 1 western grebe young were seen.

Table 12. Peak grebe estimates.

	2004	2005	2006	2007
Clark's grebe	25	65	40	40
Eared grebe	83	94	243	54
Pied-billed	88	309	587	93
Western grebe	128	597	903	240

Eared grebe.  
(Nathan Darnall -  
ES)

American white pelicans, double-crested cormorants, great blue herons, snowy egrets, white-faced ibis, and American coots are all common during the summer. Pelican use was low throughout the year reaching a peak of only 275 compared to peaks of almost 600 in 2006, 850 in 2005, and over 600 in 2004. Great egrets, cattle egrets, and black-crowned night herons can also be frequently found on the Refuge but in fewer numbers. Sandhill cranes are mainly seen during migration and usually number around 300 during the fall migration. But in 2007, over 700 sandhill cranes were seen in November. For the fifth year in a row, a green heron was seen. Once again it was seen along the Green River, though in other years it has been seen in L-10 or S-5.

American coot production was very low in 2007 with only 20 broods seen totaling 47 young. This compares to 81 broods with 181 young in 2006, 95 broods and 245 young in 2005, and only 19 broods with 45 young in 2004.

Several rookeries are present on the Refuge. Although no formal nesting counts take place at each rookery, some are easily seen from the General Avian Survey routes. The island on the river east of Leota Bottom (informally called Chapman Island) had numerous nests but only 5 nests with great blue herons sitting on them. Visibility through the leaves becomes difficult at this location but 2 great blue heron young were seen later in the summer. The other colony on the Green River, just south of the Chapman Island colony is right across the River from the L-5/L-7 dike and always has many visible nests. But in 2007, only one great blue heron was seen sitting on a nest and

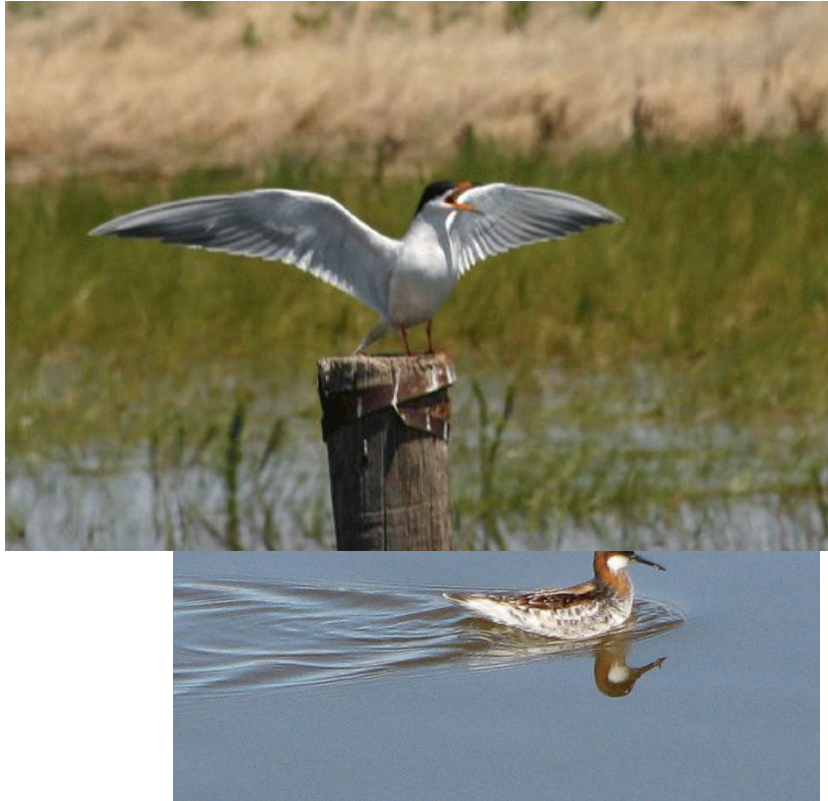


later 3 young were seen. Briefly, 12 double crested cormorants sat on nests, but they were only seen one week. In Woods Bottom the majority of the nesting is now in the corner of Woods Main. An estimated 16 - 18 trees were used in 2007. The number of nests fluctuates during the season and visibility becomes difficult with some of the trees but at least 44 great blue heron nests and 63 double crested cormorant nests were attempted. It seemed that many nests failed early on and by the end of the season at least 15 nests produced 30 - 36 young great blue herons while at least 18 double crested cormorant nests produced 39 - 42 young. In Woods Back, there are three trees that have had nests in them. In 2007, only a pair of Canada geese nested. So total known nesting for 2007 was 50 great blue heron nests with at least 17 nests producing 35 - 41 young and 75 double crested cormorant nests with at least 18 nests producing 39 - 42 young.

##### 5. Shorebirds, Gulls, Terns and Allied Species

Shorebirds started arriving at the end of March. The spring peak was the first week of May reaching 3,903 compared to only 883 in 2006, 1,410 in 2005, and 450 in 2004. Dowitchers had a very high peak of 1,186 in the spring which may be perhaps a new record. Marbled godwits also reached a high number of 432 and Wilson's phalaropes reached 1,865. But most other species were much lower than in past years. American avocets only reached 165. Black-necked stilts was a bit higher at 222. Lesser yellowlegs was only at 49. Long-billed curlews, which in most years are few and far between were seen along the river the end of June and into July reaching an estimated 45 birds. A long-billed curlew was also seen in April at the old fish hatchery site. In 2006, the peak number of American avocets was almost 200, black-necked stilts was higher with over 320, lesser yellowlegs was over 680, dowitchers was only 580, Wilson's phalaropes was 230, and red-necked phalaropes was over 150. In 2005, the peak number of American avocets was over 300, black-necked stilts was 150, lesser yellowlegs was 180, dowitchers over 970, Wilson's phalaropes over 400, and red-necked phalaropes at 27. Birds were seen in both Leota Bottom and Sheppard Bottom as many units were drying up. Only 3 young avocets were found in 2007 along with 3 young black-necked stilts, 7 killdeer, and 2 young spotted sandpipers. This compares to 10 young avocets, 21 young black-necked stilts, 2 young killdeer, and 1 young spotted sandpiper found in 2006. Due to dry conditions, there was not much of a fall migration. Only 15 species were observed in 2007 with several species noticeably absent, possibly due to lack of fall migration. Neither semipalmated nor black-

62  
bellied  
seen, nor  
  
solitary  
pectoral



plovers were  
were greater  
yellowlegs,  
sandpipers, or  
sandpipers.

Red-necked phalarope. (Nathan Darnall - ES)

Most gull  
and tern numbers were higher in 2007 than in 2006. Ring-billed gulls are commonly seen on the Refuge but were not seen in 2007 in as high of numbers as most years. California gulls were seen on one occasion in 2007. Franklin's gulls were seen many times and reached a high of 73. Bonaparte's gulls were seen on two occasions and reached a high of 185. Forster's terns reached a high of 97, but black tern numbers were very low with a high of only 9. No young terns were seen in 2007. A Caspian tern was seen again this year in June.

Forster's tern by Refuge visitor Linda.

I. Raptors

Red-tailed hawks, northern harriers, and American kestrels are common throughout the year. Turkey vultures are readily observed during the summer. Golden eagles, great-horned owls, sharp-shinned and Cooper's hawks are seen occasionally throughout the year. During the winter, an occasional rough-legged hawk will be spotted but bald eagles are frequently seen. In 2007, a high of at least 45 bald eagles were seen March 15 with most found at L-10 feeding on winter kill fish. This compares to only a high of 15 seen in 2006, 56 in 2005, 45 in 2004, and 24 in 2003. A peregrine falcon was seen on two occasions; a prairie falcon only once. After seeing a barn owl in 2006 on several occasions it was hoped those sightings would continue. But none were seen in 2007. No osprey were seen in 2007 either. However, a northern saw-whet owl was seen along the auto tour route in December.



Northern saw-whet owl. (DA)

#### 7. Other Migratory Birds

As previously mentioned, the southwestern willow flycatcher is a Federally Endangered Species. It is unlikely that the willow flycatcher on the Refuge is the southwestern willow flycatcher, but that has not been verified one way or another. The yellow-billed cuckoo is a Federal Candidate Species and a Utah Partners in Flight Priority Species. The Refuge will continue to play a vital role in the conservation of these and many other Species of Concern that are riparian dependent.

The Utah Division of Wildlife Resources (UDWR) established a point count route on the Refuge in 1992. That route was surveyed by UDWR staff again in 2007. The route was planned to be surveyed

only 3 times in 2007 instead of the usual 5 times. A total of 33 species was detected. A new record of the database was a Lincoln's sparrow. Conspicuously missing from the 2007 counts were common yellowthroats, western kingbirds, and western wood-pewees.

UDWR also conducted playback surveys for yellow-billed cuckoos from 2001 - 2006. However, no surveys were conducted in 2007. It had been several years since a cuckoo had been detected on the Refuge. But one had been heard repeatedly upriver of the Refuge from 2004 - 2006.

The Refuge hosted the Ouray NWR/Green River Christmas Bird Count (CBC) for the third year. Except for the first year of the Count, it has been held on the first Saturday of the count period. To help boost recruitment and interest, a friendly contest between Fish Springs NWR CBC and Ouray CBC started to see which count would find the most species. In 2007, a total of 14 people participated in the CBC which was held December 15. By that time the Refuge was totally frozen over and a fair amount of snow was on the ground. Pelican Lake was also frozen over. It was not looking good for a high species count and in fact the Refuge itself did have a low species count. But areas off Refuge produced a good variety of species with a total of 45 species and 1,998 total birds found that day. Both the number of participants and the number of species were the second highest. In 2006, 9 participants counted 47 species with 8,850 birds. In 2005, 15 counters found 43 species and 5,763 birds compared to only 6 participants finding 37 species totaling 3,306 birds in 2004. Incidentally, Ouray won the CBC contest with Fish Springs NWR for the second year in a row.

## 8. Game Mammals

Mule deer, pronghorn and Rocky Mountain elk occur on the Refuge. All three species co-exist and often utilize the same habitat types. Elk densities have been steadily increasing and are starting to wreak havoc with fences, irrigation sprinklers and HQ landscaping. Neighboring land owners have taken issue with the increasing number of elk and have requested depredation compensation from the State. But the Refuge has also become known as a place to come to see elk

somewhat easily and to see large mule deer bucks. Of the three big game species, only mule deer are hunted on the Refuge.



A couple of our nice mule deer bucks. (DA)

I. Other  
Resident Wildlife

Wild turkeys continue to be a more common sight on the Refuge. They have now been seen throughout the Refuge. Prior to 2004, turkey broods were a rare sighting. Now several broods have been seen each year since 2004. While most broods are seen in Leota, they have also been seen in Woods Bottom and S-2.

River otters are common on the Refuge and are frequently seen, especially in Leota. But in 2007 otters were also seen in S1a in the south ditch.

Several uncommon mammals were seen throughout the year in 2007. In January, mountain lion tracks were seen at the L-10 gate. From the tracks it appeared that a female had 1 - 2 cubs with her. A mink was seen in March in the Green River at the boat ramp. A red fox was seen on a few occasions. A muskrat was seen twice in Leota Bottom

and a young badger was seen on the road on the east side of the Refuge in Bull Durham.



Mountain lion tracks. (SB)

#### 12. Wildlife Propagation and Stocking

The only propagation and stocking of wildlife which occurs on the Refuge is that which is conducted by the Colorado River Fish Recovery Program (CRFRP). However, no fish stocking occurred on the Refuge in 2007.

#### 15. Animal Control

Beaver will occasionally interfere with water control structures. But in 2007, no beavers were removed.

#### 17. Disease Prevention and Control



Avian botulism is known to exist on the Refuge. The two areas on the Refuge which are known to be hot spots for die offs are Wyasket Lake and L-5. In 2006, botulism was found in Sheppard Bottom, mainly in S-5. In 2007, no dead birds were seen on the Refuge.

West Nile Virus was confirmed on the Refuge by the Uintah County Mosquito Abatement District (to read more on mosquito control see Section F10a). Positive samples of West Nile Virus has been found on the Refuge since 2003 in *Culex spp.* But in 2007 none were found, though positive samples were found near the Refuge. Fortunately, West Nile Virus human and horse confirmed cases were relatively low for the area.

Chronic Wasting Disease (CWD) was first found in Utah in 2002 in a mule deer buck taken during the rifle hunt near Vernal in Uintah County. Since that time 5 deer have tested positive in Uintah County which Ouray NWR is within. Luckily none of the positives have been found on or near the Refuge, but were an estimated 30-40 miles northeast of the Refuge. Since that time routine monitoring of deer and elk has been established at the Refuge. When elk or deer are seen during day to day activities and when possible, they are examined closely for obvious health conditions, counted, and recorded. In addition, a formal mule deer and elk survey has been established that is conducted three times a year. The information from that survey will hopefully lead to a better understanding of the herd populations as well as provide additional monitoring of health conditions of the animals. Hunters are strongly encouraged to have their deer and elk tested by Refuge staff; however, only a few deer that were harvested on the Refuge have been tested. Only one sick animal has been observed, a mule deer doe on the east side of the Refuge during a survey being conducted March, 2007. However, once Refuge staff were assembled at the location later that day she could not be re-located.

## **H. PUBLIC USE**

### **1. General**



Traffic counter readings totaled 7,243 (Sheppard 3,318 and Woods 3,925). The traffic counters are located at the entrance to the auto tour route and on the east side of the river at Woods Bottom. The traffic counter readings include employee traffic, but do not record all visitor use due to their location. Consideration is being given to relocation of the two traffic counters and adding one additional counter at Johnson Bottom. The permitted public use activities include wildlife observation, hunting, fishing, photography, and environmental education.

2. Outdoor Classrooms - Students

Due to reduced staffing and funding, the Refuge has reduced the number of staff assisted outdoor classrooms. Teachers are encouraged to continue making use of the Refuge but without the assistance of Refuge staff. The majority of these school groups visit in April and May for end of year school field trips.

5. Interpretive Tour Routes

The self-guided auto tour route through Sheppard Bottom and Leota Bluff was improved with the installation of stand alone interpretive panels which replaced the numbered signs that required the use of a leaflet. The route continues to be a favorite route among visitors who enjoy wildlife observation. The route provides year round access for bird watching in the spring, summer and fall as well as big

game watching in the fall and winter.

6. Interpretive Exhibits and Demonstrations

Our annual Open House was held May 13 and coincide with International Migratory Bird Day. Refuge staff, volunteers and staff from other Refuges, Hatcheries and other agencies assisted with the event. Other participating agencies included Uintah County Mosquito Abatement District, Ouray NFH, NRCS, Salt Lake City Ecological Services, and the U.S. Forest Service. Approximately 147 visitors participated in the event of which 43 were Cub Scouts who earn the Ouray Wildlife patch by participating in 10 of 15 environmental education stations.

8. Hunting

The hunting of mule deer, pheasants, ducks and geese is allowed on the Refuge. The areas which are open to hunting are: Leota Bottom for ducks, geese, deer and pheasant, and Johnson and Wyasket Bottoms for deer and pheasant hunting.

The hunting of elk on the Refuge is being considered, but due to a pending law suite filed by the Defenders of Wildlife and the National Humane Society our planning process was placed on hold.

Deer Hunting

The Refuge allows the hunting of deer with rifles, muzzle loaders, and bows and arrows. The general archery season was open from August 18 - September 14 and the extended archery season continued on through November 30 and the antlerless only hunt from Dec.1 - 15th. The muzzle loader season was open from September 26 - October 4. The general deer rifle season was open from October 20 - 28. The overall number of deer hunters on the refuge remains relatively stable, although interest in the extended archery season is increasing in the Bull Durham area of the Refuge.

### Pheasant Hunting

The pheasant population remains very low due to poor chick recruit. The few birds harvested were primarily adult birds. An estimated 25 hunters participated in the 2007 pheasant season which occurred from November 3 through December 2.

### Waterfowl Hunting

The waterfowl hunting season opened for ducks on October 6 and closed January 19. The goose season was split from October 6-18 and October 27 through January 27. Hunter turn out was very low at approximately 125 hunters. The low turn out is perhaps due to the rising cost of fuel and low water levels. Hunter success is unknown.

The Refuge was open for the youth waterfowl hunt held on September 29. The number of hunters who participated is unknown.

### 9. Fishing

Fishing within Refuge boundaries on the Green River is permitted. Channel catfish are the primary sought after species although, Northern pike and small mouth bass populations continue to steadily increase. The number of Refuge fisherman is unknown, but we estimated it to be approximately 75 fisherman.

### 11. Wildlife Observations

Wildlife observation continues to be the number one visitor activity on the Refuge. Common wildlife observation attractions are migratory birds, trophy mule deer, bugling elk, and bald eagles. Wildlife viewing areas such as the farm field and moist soil units on the Refuge provide

great wildlife viewing opportunities.

16. Other Non-Wildlife Oriented Recreation

Bicycling, hiking, and horseback riding are allowed on the Refuge tour route and levee roads. Canoeing and rafting are allowed on the river. These activities are commonly conducted as a means to view wildlife.

17. Law Enforcement

The refuge law enforcement program continues to undergo changes. In the past, Ouray NWR had as many as three Refuge Officers. The station now has one dual-function Refuge Officer (Dan Schaad). Zone Officer Lisa Kennedy has been called upon to provide more law enforcement assistance and occasionally we get some assistance from Utah Division of Wildlife Resources Conservation Officers.

Poor water/wetland conditions greatly limited the amount of waterfowl hunting opportunities in 2007 and most hunters quickly looked elsewhere. As a result there were no violations notices issued and two verbal warnings given in 2007.

Refuge staff continue to monitor and work closely with the tribal trespass grazing issue. Trespass cattle were removed by from Sheppard Bottom in March and August by the owner and these incidents documented (see file).

18. Cooperating Associations

Informal cooperating associations exist with Utah Field House of Natural History State Parks, Utah Department of Transportation, Jensen Visitor Center and the Uintah County Cooperative Weed Management Area. Both the Field House and the Jensen Visitor Center disseminate Refuge literature and information. The Refuge cooperates in the Weed Management Area through participation in the steering committee, sharing of information and knowledge of invasive

weed control and providing assistance with weed control projects which lie upstream of the refuge.

## **I. EQUIPMENT AND FACILITIES**

### **1. New Construction**

Progress continued with Ouray's VFE (Visitor Facility Enhancement) projects.

VFE - Refuge staff continued working on the accessible hunting/wildlife observation blind in Leota 10 (Asset Number 10057332). This structure consists of a 146' long x 4' wide ramp constructed of pressure-treated wood framing, recycled plastic decking and is supported by concrete piers. The blind itself is approximately 10' long and 7' wide and is wood framed and covered with cedar siding. A small parking area was also constructed adjacent to the access ramp. This phase of the project was completed by March. To complete the project a gate is to be installed near the blind, a small kiosk with interpretive sign/check-in board constructed and the blind camouflaged. Refuge heavy equipment used on this project included the excavator, backhoe, ASV/attachments and front-end loader. Total costs to date are approximately \$9,747 in materials (2821) and \$22,380 in labor (force account, 1262).



L10 accessible blind, still a work in progress.

VFE - Refuge maintenance, YCC and volunteer staff initiated construction of the 1.3 mile accessible Sheppard Bottom Trail in June. This walking trail will form a loop around the S-1 wetland impoundment to facilitate wildlife observation and interpret the benefits of riparian and wetland habitat.

The trail was formed using pressure-treated 4x4s anchored with rebar. Weed barrier was then placed and the forms filled with compacted road base crusher fines. Refuge equipment used included road grader, backhoe, ASV/attachments and dozers. A water truck and compact mini-loader were rented using regional equipment rental funds. A belly dump on loan from the Alamosa/Monte Vista/Baca complex was also utilized.

By the end of FY-07, the trail was approximately 25% complete (to finish grade). The remaining length of trail was formed out and loosely backfilled going into the winter months. To

complete the project, crusher fines need to be compacted, corners tied in , and benches/interpretive signs installed. To date, approximately \$25K in materials have been purchased and 712 man-hours logged on this project.

VFE - An Interagency Agreement (601816N474) was approved (in June 2006) with the Bureau of Reclamation to provide labor, material equipment for the design and construction of an accessible fishing pier at a cost of \$95,000. The project also included the removal of old pump station debris (sheet pile/concrete distribution box) prior to construction. Due to increased materials (sheet pile) costs, the agreement amount was modified and increased to \$126,200 in March 2007. Work did not commence until November 2007, but by years end the project was mostly complete.

Refuge maintenance and YCC staff installed vehicle parking area barriers at the L9/10 and L8/9 pull-outs in May and June.

Refuge staff constructed a new concrete pad/containment wall in July and August in preparation for transfer of a 1000 gallon bulk diesel tank from the Leadville NFH. The tank was hauled and installed in August. The refuge rented cranes in Colorado and Utah to safely load and off-load the tank. This tank will be used to store off-road diesel, which will provide the station considerable cost savings in the future.





J&C Enterprises was contracted to safely off-load the bulk diesel tank transferred from the Leadville NFH.

## 2. Rehabilitation

A deferred maintenance project to replace the L-10 drain/to center canal wcs was initiated (WO#2006510667, AN #10034518). An Interagency Agreement (80181-7-N623) was signed with the Bureau of Reclamation to construct this structure. The project was initially funded at \$49K but due to increased costs of concrete, steel and other materials the agreement was modified to \$60,390. A site visit between refuge and BOR staff occurred in June to finalize specifications. BOR started work on 09/04/07 and had completed most of the concrete work by 09/21/07. They returned to work in mid-November to install the cattle-guard top, grating and rails, however by years end the job was not 100% complete and there were indications of more cost over-runs. To help keep costs down, refuge staff used the station excavator to prepare the site and hauled rock for the foundation base.

Refuge staff remodeled portions of Quarters 1 in March (Asset # 10035911, Work Order #10034465). The project included replacement of bathroom flooring (tile), dry wall, doors, tub/shower/surround, light fixtures, vanity, paint and hallway linen closet.

Refuge staff corrected water drainage/leakage problems along the north wall of the office building in April (WO# 2007726814). The project involved hand digging along the back retaining wall, applying concrete sealant and forming/pouring a concrete pad to divert water to an existing french drain to prevent water entering the back of the building. This repair solved the drainage problem.



Maintenance staff formed and poured a concrete pad to help resolve water/drainage problems.

Refuge staff repaired erosional damage to the auto-tour route in Sheppard Bottom in August. This included building up road/levee edges and replacing lost road base (WO's

2007649043 & 2007747560). They also restored levee slopes in S1 in September (WO 2007731899).

A safer/improved lumber storage rack was purchased and installed in the wood shop bay by November.

### 3. Major Maintenance

The \$72.6K in annual maintenance funds (MMS) was spent primarily on vehicle, equipment, buildings/facilities maintenance and fuel.

The CAT 320L excavator required service calls from Wheeler machinery in May and August to trouble shoot and repair hydraulic and engine systems due to lack of power and hydraulic response. Total cost was \$1,547.

The Case MW24C loader required a service call from Wheeler Machinery in July to reseal two lift cylinders. Total cost was \$1,915.

The CAT D-6 dozer required service calls from Wheeler Machinery in July (transmission service, \$611) and August (radiator repair etc., \$1,752).

The CAT 613C scraper was serviced by Wheeler Machinery in August to pressure test its oil coolant system. Cost was \$365.

The 2004 F-350 required replacement of the rear bumper and repair to passenger side rear quarter panel due to operator error (see Safety Section). Repair work was provided by Higgins Body & Paint in Vernal. Cost was \$2,304.

Refuge staff replaced broken drain valves along the Pelican Lake water pipeline (farm-leg) in March (WO 2007726843, AN 10054028) and repaired a main-line leak to this pipeline in April (WO 2007726805).

Refuge staff replaced the bunkhouse dishwasher.

#### 4. Equipment Utilization and Replacement

Equipment rental funds were used to rent a 2,000 gallon water truck to assist in maintaining refuge roads and constructing the Sheppard trail (\$7,100). Additional rental funds were used to rent a compact track loader and trench compactor for the trail project.

Ouray loaned the Seedskaadee/Cokeville Meadows complex the Caterpillar 613C scraper in August to be used on wetlands restoration projects conducted at Cokeville Meadows NWR.

A 2006 Honda Fourtrax Rancher TRX350FE ATV (w/ winch) was purchased from Carbon-Emery Motorsports (Helper, UT) and received on 08/27/07. Total cost was \$5,358.00.

A Freightliner 6x4 Dump Truck (64K GVWR, 15YD) was ordered through GSA and received on 11/5/07 at a cost of \$115,443.00.

A Small Lot Sale was conducted in October. Items that sold included the old equipment storage building (10034468), three wheel-line irrigation systems, six cattleguards and two pipe gates.

Several vehicle were replaced in FY07 and sold through GSA. They included a 1979 IHC 5YD dump truck, a 1971 military Jeep dump truck with snow plow blade and a 1988 Ford F350 Type 6 fire engine. These items were sold and picked up in July.

A Texas Bragg 18' utility trailer (630389) was transferred to the Arapaho NWR in August.

A Lincoln welder/trailer (246408 & 667421) and Century wire welder (667439) were transferred to the Ouray NFH in August.

#### 6. Computer Systems

A Dell Optiplex 745 (80GB HD) desk top computer with 19" flat-screen monitor and other accessories was received on 11/16/07. This will be the administrator's computer (PN 694337). Total cost was \$1,042.51.

A Lexmark X7350 Inkjet Printer/Scanner was ordered and received on 12/4/07 at a cost of \$130.34 (PN 694338) to go along with the above PC.

A Trimble Geo XT GPS unit was purchased in August (PN 690313, cost \$3,865.00).

Several outdated computers were donated to local educational institutions in August.

## **J. OTHER ITEMS**

### **3. Items of Interest**

#### **Travel & Training:**

PL Alonso traveled to Grand Junction, CO to attend the Annual CRFRP Researchers meeting January 17 - 18.

DRM Schaad attended LE In-Service training in Marana, AZ January 29- February 2.

RB Penttila traveled to Fort Collins, CO to attend a Bird Monitoring Workshop on Distance Sampling Techniques February 28 - March 2.

PL Alonso attended the Project Leaders Meeting held at Bear River MBR March 5 - 7.

RB Penttila attended an Independent Study course for Access in February at the Uintah Basin Applied Technology Center in Vernal.

DRM and RB Penttila assisted the BLM in a prescribed burn preparation in Marshall Draw on March 23.

PL Alonso traveled to Denver, CO April 23 - 24 to attend RIP Biology Committee Meeting.

RB Penttila attended RLGIS training at Bear River MBR in Brigham City, UT April 23 - 26.

MM Breakfield attended Collateral-Duty Safety Officer training in Denver (Regional Office) May 1 - 3.

PL Alonso, DRM Schaad, and OAC Johnson traveled to Grand Junction, CO May 7 -8 to attend SAMMS refresher training hosted by refuge regional and field staff.

DRM Schaad, RB Penttila, and MM Breakfield attended the annual fire refresher training at the Interagency Fire Center in Vernal on June 1.

MM Breakfield, MW Driscoll, and OAC Johnson attended CPR/First Aid training hosted by the BIA in Fort Duchesne on June 19.

OAC Johnson traveled to the National Elk Refuge in Jackson, WY to attend Administrative Training June 24 - 28.

PL Alonso traveled to Grand Junction, CO to inspect CRWMA easements July 19 - 21.

MW Tim Driscoll received heavy equipment training/certification July 24 -27. Training was provided by Rich Iwanski from the Bear River MBR. Ouray Hatchery staff attended this training as well.

DRM Schaad traveled to Provo, UT to attend supervisory training on July 26.

RB Penttila and weed crew, Chester, Melius, Nelson, and Staats traveled to Moab, UT to collect beetles for biological control of Tamarisk on August 13 - 14.

BT Chester assisted with RLGIS weed mapping at Browns Park August 20 - 21.

PL Alonso traveled to Brigham City, UT to attend Avian Influenza training at Bear River MBR on August 27 & 28.

DRM Schaad attended LE requalifications and avian influenza surveillance training at Bear River MBR August 28 - 29.

RB Penttila and MM Breakfield assisted the BIA with a prescribed fire in Tabyago Canyon in the Book Cliffs September 12 - 16.

RB Penttila and weed crew, Chester, Melius, and Nelson attended the Tamarisk Symposium in Grand Junction, CO October 24 - 26.

MW Driscoll assisted with National Bison Range round up operations September 24 - October 11.

RB Penttila attended the R6 zone Biologist Meeting in Malta, MT September 30 - October 6.

Facility Management Coordinator Eva Paredes was on station in early October to conduct a Comprehensive Condition Assessment for the Ouray NWR. DRM Schaad provided informational/logistical support for the CCA.

Ouray staff assisted Browns Park NWR replace a concrete garage floor and the foundation in one of their refuge residences at the sub-headquarters in November.

DRM Schaad was detailed to Browns Park NWR as Acting Refuge Manager effective November 1 to temporarily fill in behind RM Lee Albright who transferred to Region 1 in October. This detail is for a minimum of 60 days, but will likely be for an extended time period before the next manager is hired.

#### 4. Credits

This document was prepared as a cooperative effort by all refuge staff. Photo credits are as follows:

Dan Alonso	DA	Steve Breakfield	SB
Dan Schaad	DS	Diane Penttila	DP